Urban Growth Management Study

Portland Case Study

Prepared by
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with
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November 1990

Oregon Department of Land Conservation and Development

Land Conservation and Development Commission

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CHAPTER ONE
INTRODUCTION

A. PURPOSE

In June 1989 the Oregon state legislature approved funds for the Oregon Department of Land Conservation and Development (DLCD) for an Urban Growth Management Study to (1) evaluate the effectiveness of the growth management policies of Oregon's statewide planning program, and (2) determine how they could be improved. One component of that larger study is this study of urban growth in four urban areas.

In April 1990, DLCD hired ECO Northwest, a consulting firm in land-use planning and economics, to study issues related to urban growth in the four case-study areas in Oregon. ECO's previous report (*Case Studies, Phase 1: Methodology*, May 1990) describes in more detail the purposes of the study and the issues it is to address.

This report presents our preliminary analysis of urban growth in the Portland case study area. This report serves as a working paper that will be reviewed by planners and officials in the Portland case study area. Comments and suggestions by these reviewers will be included in the final case study report as appropriate. To facilitate comments, we have printed the report as a draft with a wide right margin.

B. METHODS

For a detailed description of the issues this case study is designed to evaluate, and the methods for making that evaluation, see the previous reports that were part of this project: *Case Studies, Phase 1: Methodology*, May 1990; and *Supplement to the Methodology Report*, July 1990. For details on specific methods and sources used for this case study, see the Appendix to this report.

We defined the Portland case study area as the three metropolitan counties (Clackamas, Multnomah, and Washington). These counties are rough proxies for Oregon's portion of what we call the Portland *urban region*: the area within commuting distance of Portland-area employment. In addition, for some of our measurements, we included Vancouver and part of Clark County, Washington.

Over thirty cities and counties are responsible for land use planning and growth management in this area. We could not collect and analyze data from every jurisdiction. Therefore, we had to rely on standard data sources for our area-wide analysis. The Metropolitan Service District (Metro) in Portland and the Intergovernmental Resource Center (IRC) in Vancouver collect and analyze data from an area that covers our study area.

Our analysis focuses on changes in urban growth from 1985 through 1989. This time period was chosen because (1) it represents the period of greatest growth since comprehensive plan acknowledgement, and (2) it allows for the greatest possible comparability between case studies as data are not generally available for earlier periods. When we could not obtain data even for this time period, we obtained data for the longest subset of that period possible.

Using the Metro and IRC data, we defined four *analysis areas* based on (1) the density of development in 1985, measured as population plus employment per acre, and (2) location with respect to the UGB. For Oregon, Metro reports population and employment data by *Underlying Zone* (UZ): the 1806 UZs in the three-county study area, defined for transportation analysis purposes, aggregate to census tracts. In Oregon, the *urban area* consists of UZs containing high density development inside the UGB in 1985. In practice, the cut-off

density between urban and urbanizable was about five people (population plus employment) per acre. Our hope is that the definition is such that most new development in the urban area consists of infill or redevelopment. The *urbanizable area* consists of the remaining UZs in the UGB. Low density is our proxy measure for the real variable of concern that was not readily available: vacant land. UZs outside and within about a mile of the UGB define the *urban fringe*. The *rest of the urban region* consists of the remaining UZs in the study area. For convenience we sometimes refer to the combination of the urban fringe and the rest of the region (i.e., all land outside the UGB) as the *exurban area*. Figure 1-1 shows roughly our analysis area as defined by 1985 densities and the UGB.

In Clark County, the IRC collects data for 123 Transportation Analysis Zones (TAZs) which also aggregate to census tracts. In Clark County, TAZs replace UZs and the urban/rural service boundary replaces the UGB in the analysis. As we explain in more detail in the Appendix (section 3), using the Clark County service boundary is a poor proxy for an urban growth boundary, but the best available to us. Compare Oregon and Washington data about development inside and outside the urban/rural boundaries with care.

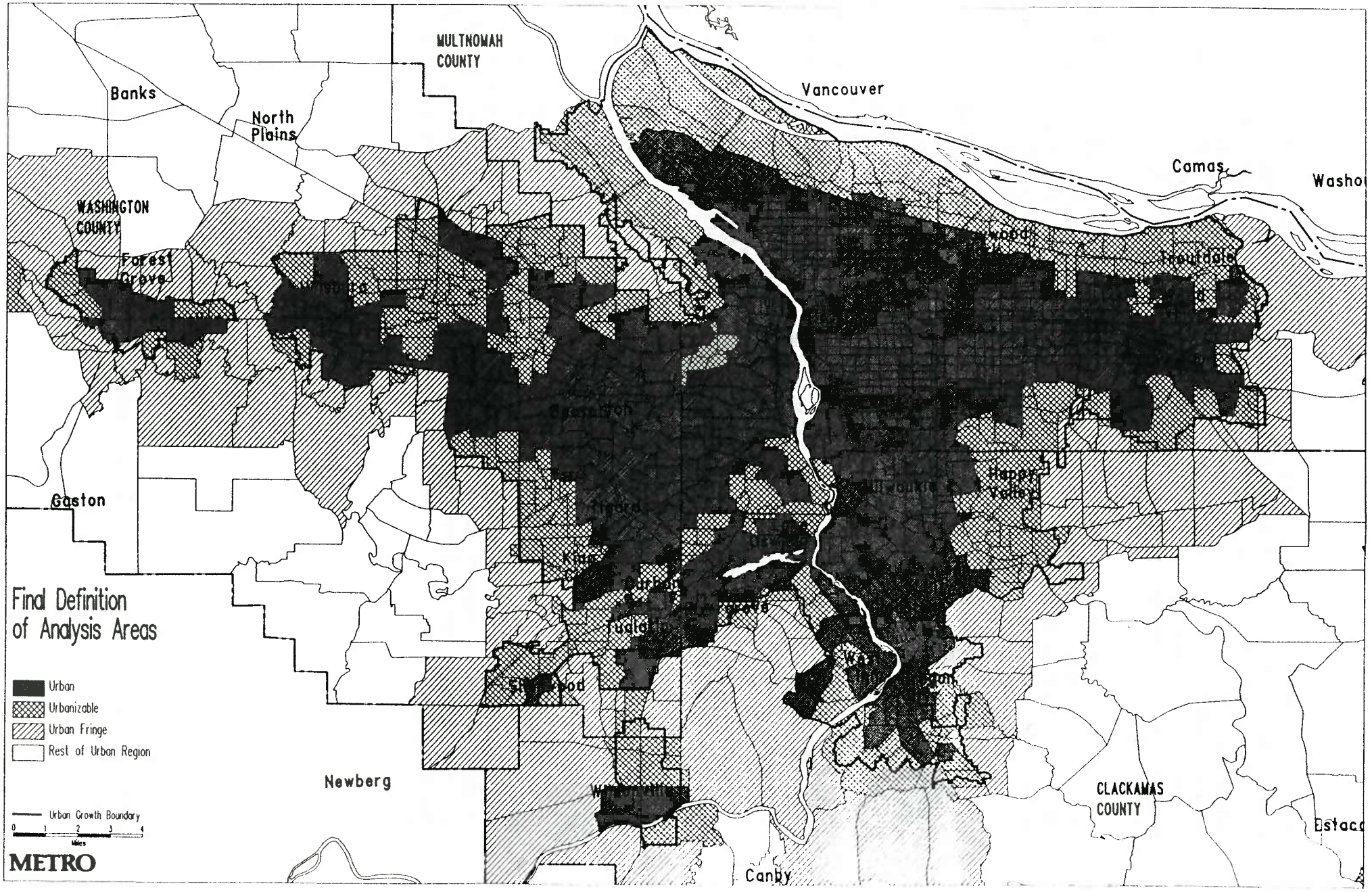
We used several databases to describe growth in the study area. Metro provided residential building permit data by UZ from 1985 through 1989, as well as employment and population data by UZ from the first quarter of 1985 to the first quarter of 1988. The IRC supplied employment and population data by TAZ from 1985 through 1988. Brent Bishop, a real estate analyst and property management consultant, maintains a database which, among other things, shows lot size for every subdivision built in the study area from 1985 through 1989. 1000 Friends of Oregon supplemented the Bishop data with zoning data collected as part of their housing study in progress. Brent Bishop also provided a database containing information on every apartment complex containing thirty or more dwelling units. 1000 Friends also supplemented this database by adding smaller complexes and as well as zoning information. We also were provided preliminary data, from work in progress, by Clackamas County concerning development patterns near the UGB.

In addition to our regional analysis, we conduct a more detailed analysis of building and land division for a subarea of the region. We chose an area in Washington County that we felt would give data about three of our four analysis areas (urban, urbanizable, and fringe,). It includes the unincorporated Metzger area east of Beaverton, most of the City of Beaverton, the unincorporated Cooper Mountain area west of Beaverton and inside the UGB, and the unincorporated Cooper Mountain area outside the UGB. In this subarea, we look at all land partitions, subdivisions, and multiple family developments. This subarea study is <u>not</u> statistically representative of the entire study area: readers will have to draw their own conclusions about the extent to which the development patterns we report are representative of other subareas in the region.

The Portland case study is unlike the other three case studies (Bend, Brookings, and Medford) in that the metropolitan area has a single UGB that applies to 24 cities and 3 counties. We could not evaluate policies and data for each of those jurisdictions: we had to use consolidated data from state and regional agencies. As a result, we did not address some of the issues that we addressed in other case studies. In particular, an analysis of local infrastructure finance--which in other case-study areas required, at a minimum, an evaluation of local public facility plans and interviews with city and special district planners and engineers--was not possible in Portland.

Figure 1-1

ANALYSIS AREAS



C. HOW TO READ THIS REPORT

Readers not familiar with the Portland area should begin with **Chapter Two**, which gives a brief overview of growth in the area. Readers wanting a summary of the findings should go to **Chapter Three**, which describes changes in three classes of issues of concern to DLCD: (1) land development, (2) livability, and (3) infrastructure investment from 1985 through 1989[1]. The data in Chapter Three are all contained in more detail in an **Appendix**, which describes sources, methods, and our analysis of all the data we collected. The full Appendix will probably be of interest only to a technical audience; others may want to scan it or turn to it for more detail about issues of interest to them.

[1]We provide these three classifications to help organize the report. DLCD's concerns remain the individual issues that compose these classes, not the classes themselves.

CHAPTER TWO
CASE-STUDY AREA PROFILE

In this chapter we provide an overview of the Portland case-study area. We describe the following key characteristics that affect growth in the Portland case study area: (1) jurisdictions included in this case study, (2) size (e.g., population, employment, and land area), (3) base economic activities; and (4) historic population and employment growth.

A. BOUNDARIES

This report defines the Portland case study area as Clackamas, Multnomah, and Washington Counties. We also analyze data from Clark County in Washington state. Large parts of all three counties and 24 cities are contained by a single urban growth boundary for the Portland metropolitan area. Smaller incorporated areas exist outside this main UGB.

B. SIZE

The metropolitan area, consisting of Multnomah, Washington, and Clackamas Counties, covers 3,026 square miles, with Clackamas County comprising about 60 percent of this total. As of 1989, the Portland State Center for Population Research and Census (CPRC) estimated that the metropolitan area had a population of about 1.1 millon, making it the most heavily populated portion of Oregon. Multnomah County had about 600,000 residents in 1989 (83% of which live the Portland) making it the most populous county in Oregon. The metropolitan area's overall population density in 1989 was about 377 persons per square mile. By the year 2000, the metropolitan area's population is expected to grow to about 1.3 million.

C. ECONOMIC BASE

The area economy is the largest urban economy in Oregon. Its industrial base is a highly diversified manufacturing sector, business and personal services, and trade. The manufacturing sector produces a wide range of products including computers, instruments, transportation equipment (e.g., trucks, barges, and rail cars), paper, electrical and non-electrical equipment. Portland service firms in the medical and financial markets export to other national and international markets, particularly to Pacific Rim countries. Warehouses in Portland serve manufacturers and retailers throughout the Pacific Northwest. Portland has one of the most diversified economies on the Pacific coast, which makes it attractive to a broad cross-section of expanding industries and reduces the local effects of national recessions.

D. GROWTH INDICATORS

Table 2-1 shows population and employment growth in the metropolitan area from 1985 to 1988 (the last year for which Metro has data). The area had an annual employment growth rate of over 4% since 1985 and annual population growth of 1.3%. The fastest growing areas are in Washington and Clackamas Counties.

TABLE 2-1

HISTORIC POPULATION AND EMPLOYMENT GROWTH FOR PORTLAND METROPOLITAN AREA AND OREGON, 1985-89

Jurisdiction	1985	1988	% Change	Average Annual Growth Rate
Population	1,076,975	1,119,710	4.0	1.3%
Clackamas	248,991	262,044	5.2	1.7%
Multnomah	563,996	568,486	0.8	0.3%
Washington	263,988	289,180	9.5	3.2%
Employment	553,940	627,676	13.3	4.4%
Clackamas	85,070	99,107	16.5	5.5%
Multnomah	347,653	387,841	11.6	3.9%
Washington	121,217	140,728	16.1	5.4%

Source: Metropolitan Service District Underlying Zone Database.

CHAPTER THREE
FINDINGS AND CONCLUSIONS

This chapter presents key findings and conclusions about land development and livability issues in the Portland metropolitan case study area. See the Appendix for a more detailed description of the data that led us to the conclusions.

A. DEVELOPMENT ISSUES

We use data from 1985 through 1989 (principally building permits, subdivision development, multiple family development, and densities allowed by zoning) to address each development issue. Our analysis is necessarily general: we could not do a case study for each of the 24 cities and three counties with land inside the metropolitan urban growth boundary (UGB).

In other case study areas in Oregon we relied heavily on assessment data, both because other data sources were not available and the areas we were evaluating were of a small enough size to make the manipulation of those data manageable. In the Portland case study areas neither of those conditions applied. We were fortunate to have very good data available from the Metropolitan Service District (Metro) and from two privately maintained databases on metropolitan subdivision and multiple family development activity.

Our discussion of development is organized according to the four development issues identified to DLCD, which correspond roughly to the four analysis areas we used for this study: outside the UGBs but within commuting distance (which we refer to as either the *exurban area* or *rest of urban region*), outside and adjacent to the UGB (*urban fringe*), *urbanizable* land inside the UGB, and *urban* (largely developed) land inside the UGB. Figures 3-1, 3-2, and 3-3 give an overview of the pattern of residential growth in these areas between 1985 and 1989.

DEVELOPMENT OUTSIDE URBAN GROWTH BOUNDARIES VERSUS DEVELOPMENT INSIDE URBAN GROWTH BOUNDARIES

About 5% of the 43,155 single and multiple family dwelling units built or placed in the three-county study area from 1985 through 1989 were located outside of UGBs. See Table 3-1 for a breakdown of these units by type and by location.

About 9% of the 20,721 single family dwelling units built or placed in the three-county study area from 1985 through 1989 were located outside of UGBs. This percentage varied from about 20% exurban development in Clackamas County to about 4% in Multnomah and Washington County. The amount of exurban growth between 1985-89 in each county as a percent of its existing exurban in 1985 was about the same in all three counties: about 12%.

Figure 3-1

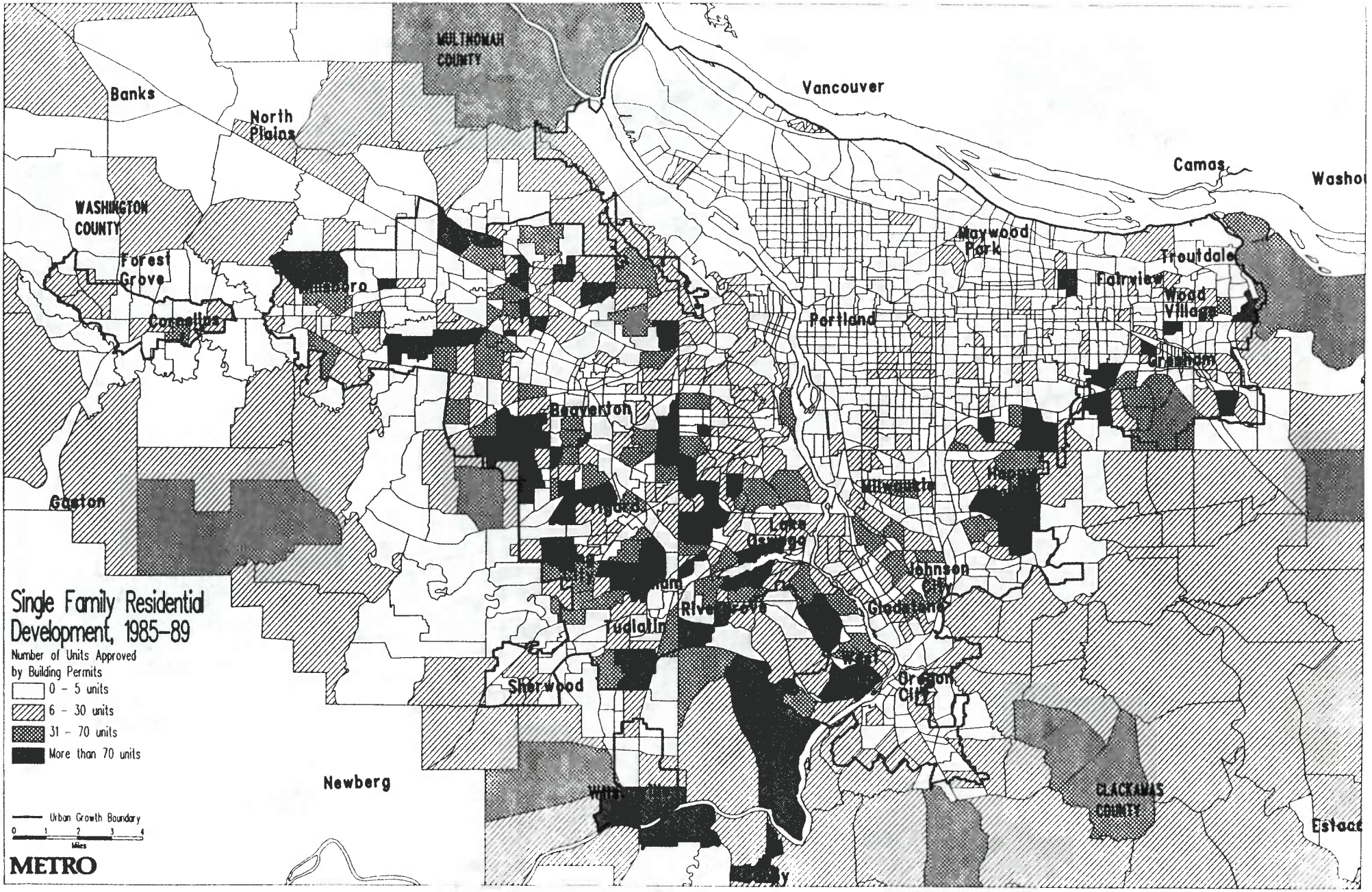

MULTNOMAH COUNTY
Banks
North Plains
Vancouver
Camas
WASHINGTON COUNTY
Forest Grove
Cornelius
Hillsboro
Portland
Maywood Park
Troutdale
Fairview
Wood Village
Gresham
Beaverton
Tigard
Lake Oswego
Milwaukie
Johnson City
Gladstone
Tualatin
West Linn
Oregon City
Sherwood
Newberg
Wilsonville
CLACKAMAS COUNTY
Estacada
Gaston
Single Family Residential Development, 1985–89
Number of Units Approved by Building Permits
0 – 5 units
6 – 30 units
31 – 70 units
More than 70 units
Urban Growth Boundary
0 1 2 3 4
Miles
METRO

Figure 3-2

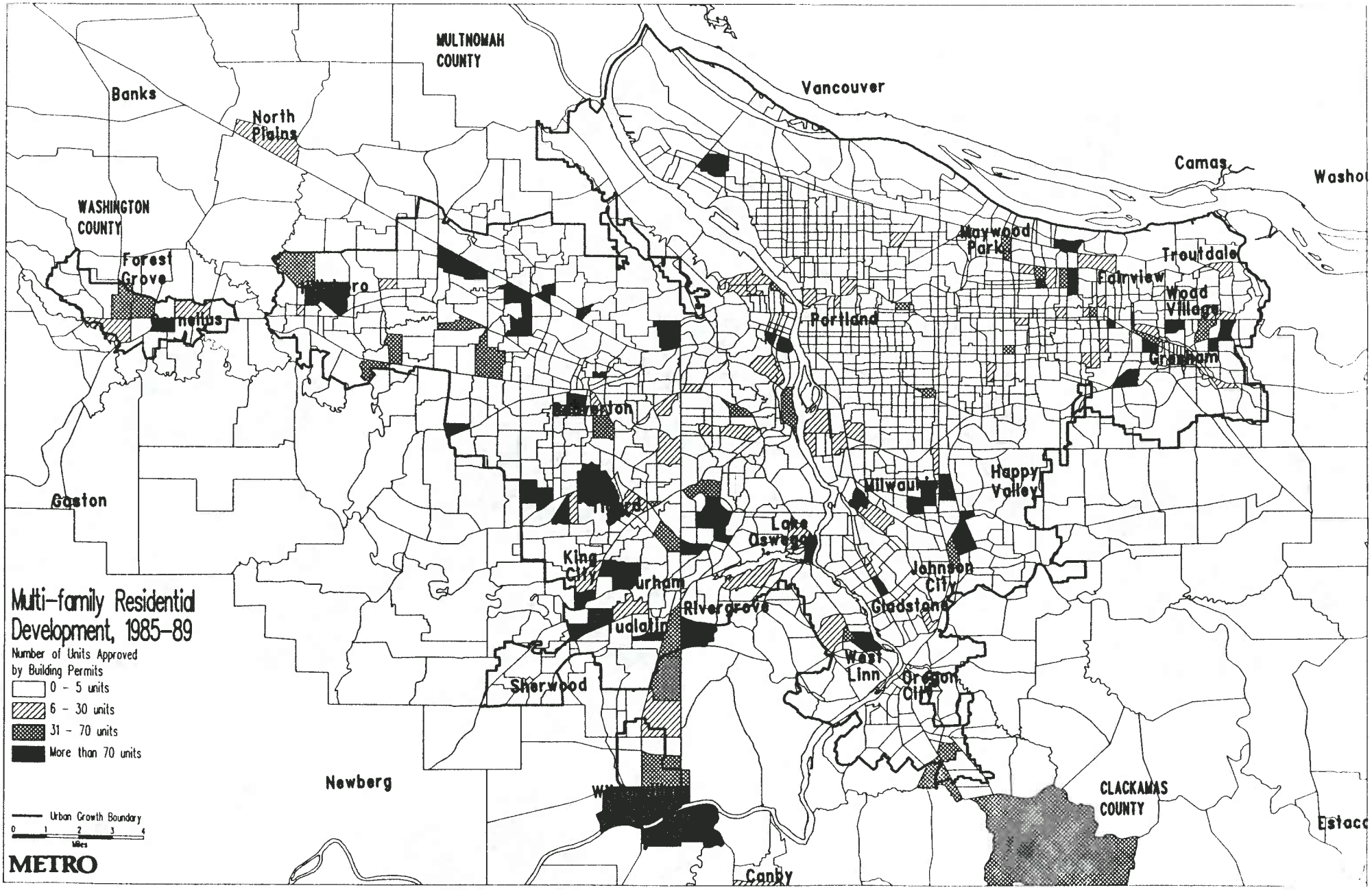
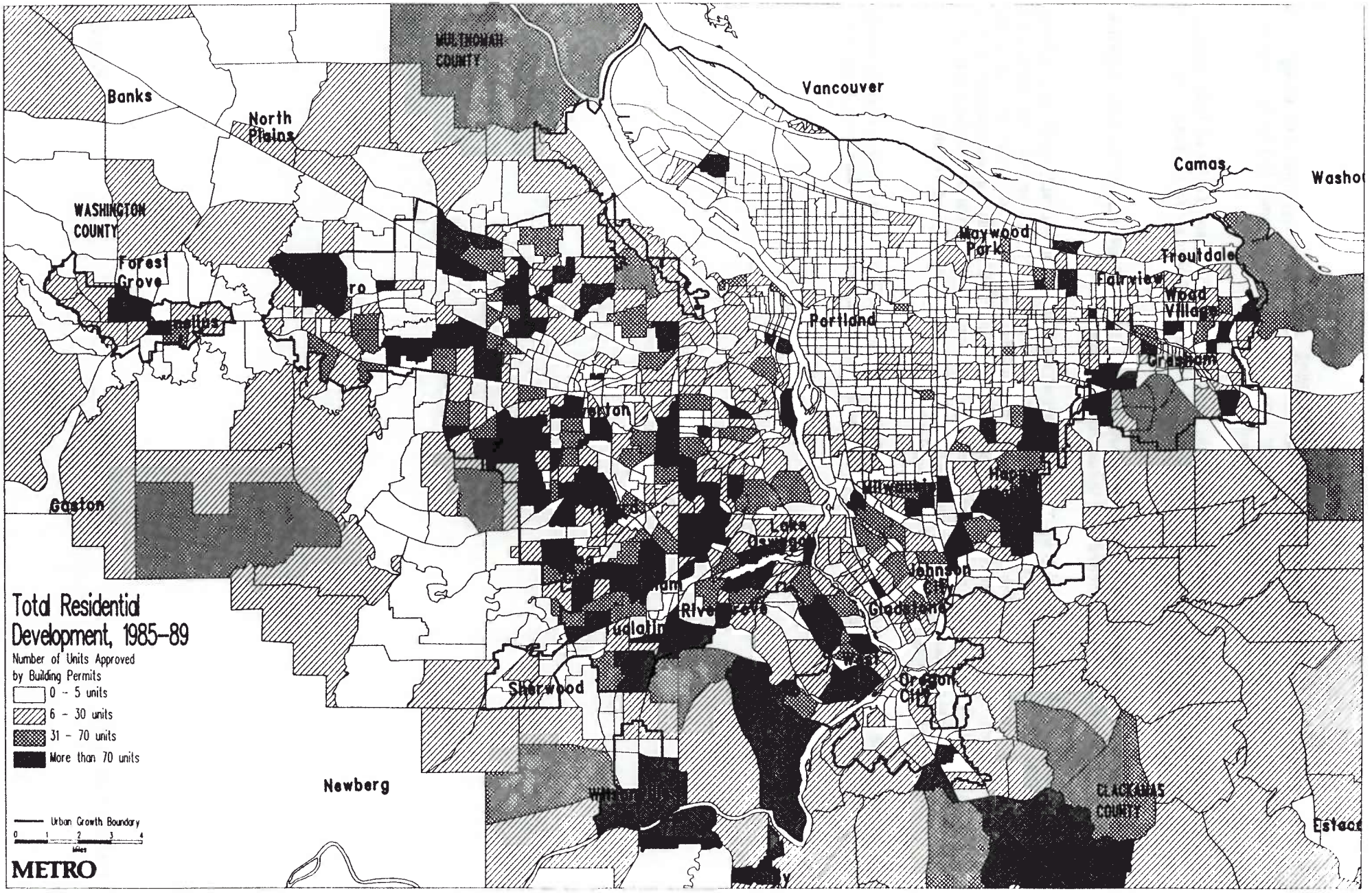

MULTNOMAH COUNTY
Vancouver
Banks
North Plains
Camas
WASHINGTON COUNTY
Forest Grove
Maywood Park
Troutdale
Fairview
Wood Village
Portland
Gresham
Happy Valley
Gaston
Lake Oswego
Johnson City
Gladstone
Rivergrove
West Linn
Oregon City
Sherwood
Newberg
CLACKAMAS COUNTY
Canby
Multi-family Residential Development, 1985-89
Number of Units Approved by Building Permits
0 - 5 units
6 - 30 units
31 - 70 units
More than 70 units
Urban Growth Boundary
0 1 2 3 4
Miles
METRO

Figure 3-3


MULTNOMAH COUNTY
Banks
North Plains
Vancouver
Camas
WASHINGTON COUNTY
Forest Grove
Maywood Park
Troutdale
Fairview
Wood Village
Portland
Gaston
Lake Oswego
Johnson City
Gladstone
Tualatin
Sherwood
Oregon City
Newberg
CLACKAMAS COUNTY
Total Residential Development, 1985–89
Number of Units Approved by Building Permits
0 - 5 units
6 - 30 units
31 - 70 units
More than 70 units
Urban Growth Boundary
0 1 2 3 4
Miles
METRO

Less than 1% of the 22,434 multiple family units built in the three-county area from 1985 through 1989 were located outside of UGBs. This percent varied from 2% in Clackamas County to about 0% (rounded) in Multnomah and Washington Counties.

About 1% of subdivision lots developed in the three-county area between 1985 and 1989 occurred outside UGBs. This percent varied from about 3% in Clackamas County to 0% in Multnomah County (about 1% in Washington County).

Net employment changes in the three-county area between 1985 and 1989 outside UGBs were negative, implying no significant commercial or industrial development.

The potential exists to develop up to 11,600 dwelling units in the three-county study area outside UGBs. At the current rate of development, this represents over a 20 year supply of developable land outside UGBs. Roughly 60% of the development potential is on existing vacant lots in exception areas, 30% results from the creation of new lots in exception areas, and 10% results from our assumption that historical rates of housing development on resource land (nonfarm and nonforest dwellings, will occur between now and the year 2000. About 62% of the development potential is in Clackamas County, 26% in Washington County, and 12% in Multnomah County.

Based on our Washington County Subarea analysis, less than 1% of the new lots created were the result of the partitioning process. About half of the lts occurred at densities of greater than four lots per acre.

TABLE 3-1

BUILDING AND LAND DIVISIONS
1985-89

Analysis Area	Residential Building Permits				Subdivisions	
	Single-Family Units		Multiple Family Units			
	# of Units	%	# of Units	%	# of Lots	%
Inside UGBs	18,793	90.7	22,318	99.5	14,272	98.8
Inside Portland UGB	18,628	89.9	22,251	99.2	14,079	97.5
Urban	11,127	53.7	14,510	64.7	9,707	67.4
Urbanizable	7,501	36.2	7,741	34.5	4,372	30.1
Inside Other UGBs	165	0.8	67	0.3	193	1.3
Outside UGBs	1,928	9.3	116	0.5	175	1.2
Portland Urban Fringe	713	3.4	0	0.0	151	1.1
Rest of County	1,215	5.9	116	0.5	24	0.1
Total	20,721	100.0	22,434	100.0	14,447	100.0

Source: Metro underlying zone database; special subdivision database.

DEVELOPMENT OUTSIDE OF AND ADJACENT TO URBAN GROWTH BOUNDARIES

Of the dwelling units built or sited outside UGBs in the three-county area, about 36% occurred in the urban fringe around the Portland UGB. (We defined the fringe as Metro underlying zones contiguous to the UGB--see Map 6 and section 3 of the Appendix for more information). Of 713 single family residential building permits issued for sites in the urban fringe, 60% were for sites in Clackamas County, 19% in Multnomah County, and 21% in Washington County.

Of the subdivision lots developed outside UGBs in the three-county area, about 86% occurred in the urban fringe around the Portland UGB. Of the 151 lots developed in the urban fringe, 57% were developed in unincorporated Clackamas County, all with lot sizes greater than two acres, and with 71% on lots of five acres or larger. The remaining 65 subdivision lots were developed in Washington County with an average lot size of about one acre.

Of the multiple family units developed outside UGBs in the three-county area, none occurred in the urban fringe around the Portland UGB.

The rural residential pattern of development in the urban fringe will make efficient urbanization difficult in the future. In the few subareas we reviewed, residential development immediately outside the UGB often occurs on long, narrow lots of from two to five acres in strips along county roads (see e.g., the Rock

Creek area in Clackamas County). Due to access limitations, newer development often occurs in a "panhandle" configuration. Larger lots often have poor access, and are located behind developed strips. Homes appear to be sited in a random fashion, making future road extensions difficult. Those who now enjoy rural residential living can be expected to oppose UGB expansion and subsequent development in their neighborhoods.

All three counties in the study area have adopted rural planned unit development ordinances that allow for clustering of housing on smaller (one to two acre) lots, leaving the remainder of the property undeveloped and potentially available for future urbanization. The PUD process allows for more dwelling units that have lower impact than traditional rural residential patterns.

DEVELOPMENT IN URBANIZABLE AREAS

Of the 41,111 single family and multiple family residential building permits approved for sites inside the UGB, 37% (15,242) occurred in urbanizable areas.

Of the 18,793 single family residential building permits approved for sites inside the UGB, 40% (7,501) occurred in urbanizable areas. About 30% of these were approved in Clackamas County, 17% in Multnomah County, and 53% in Washington County. (Note that because of the way data were available and our definition of urbanizable land, we probably under allocate units to "urbanizable" and overallocate to "urban." We believe that the combined totals for inside the UGB (urbanizable plus urban), however, are very accurate.

Of the 22,434 total multiple family dwelling unit construction approvals inside the UGB, about 35% (7,741) occurred in urbanizable areas. About 21% of these were approved in Clackamas County, 8% in Multnomah County, and 71% in Washington County.

Multiple family housing accounted for about 51% of all building permits approved between 1985 and 1989 in the urbanizable areas. Average densities were highest in Clackamas County (26 units per acre). Multnomah County averaged 17 units per acre, and Washington County averaged 14.

TABLE 3-2

ACTUAL VS. ALLOWABLE DENSITY OF RESIDENTIAL DEVELOPMENT
Dwelling Units Inside the Portland UGB
1985-89

Analysis Area	Single-Family			Multiple Family		
	Actual Density	Allowable Density	% of Allowable	Actual Density	Allowable Density	% of Allowable
Clackamas County	4.2	6.1	69	15.6	21.5	73
Urban	4.0	5.4	93	13.8	17.8	76
Urbanizable	4.8	7.7	62	25.9	42.3	61
Multnomah County	4.7	6.2	76	27.7	41.1	68
Urban	4.7	6.3	75	28.3	42.2	67
Urbanizable	4.4	5.5	80	17.1	18.1	94
Washington County	5.2	8.4	62	15.8	19.2	82
Urban	5.5	8.3	66	17.1	20.1	85
Urbanizable	4.7	8.6	55	13.9	18.0	77
Study Area Total	4.9	7.5	65	16.5	21.3	77
Urban	4.9	7.2	68	16.9	21.2	80
Urbanizable	4.7	8.3	59	15.6	21.5	73

Source: Special Subdivision Database (see Appendix 3)
Special Apartment Database (see Appendix 3)

Single family lots (in subdivisions) developed from 1985-89 averaged just under five lots per net acre in the urbanizable area. The average lot size in each county was from 9,000 to 10,000 square feet. The consistency of average lot sizes across counties in urbanizable areas, compared to allowable densities, suggests strongly that zoning has not been a major constraint on achieving higher development densities. There appears to be a clear market preference for large lots in suburban areas.

Actual development for single family lots was about 59% of allowable densities. Table 3-2 shows the distribution by county: Clackamas 62%, Multnomah 80%, Washington 65%. Note that because actual densities are similar in each county, these percentages show that Clackamas and Washinton Counties allow higher density development than Multnomah County.

Multiple family units developed from 1985-89 averaged about 17 units per net acre in the urbanizable area. Clackamas County's urbanizable area, which allowed an average of 41 of units per acre (three projects were developed in zones allowing 60 units per acre), achieved actual densities 50% greater than urbanizable areas in the other two counties.

Actual development for multiple family units was about 73% of allowable densities. Table 3-2 shows the distribution by county: Clackamas 61%, Multnomah 94%, Washington 77%. These figures do not

account for single family residential development that may have occurred on land zoned for multiple family use.

DEVELOPMENT IN URBAN AREAS

Of the 18,628 single family residential building permits approved for sites inside the UGB, about 60% occurred in urban areas. About 27% of these were approved in Clackamas County, 24% in Multnomah County, and 49% in Washington County.

Of the 22,251 total multiple family dwelling unit construction approvals inside the UGB, about 65% occurred in urban areas. About 27% of these were approved in Clackamas County, 24% in Multnomah County, and 49% in Washington County, the same as for single family permits.

Multiple family housing accounted for about 57% of all building permits approved between 1985 and 1989 in the urbanizable areas.

Single family units (in subdivisions) developed from 1985-89 averaged about five lots per net acre in the urban area--about 68% of allowable densities. Table 3-2 shows the distribution by county: Clackamas 93%, Multnomah 75%, Washington 66%.

Multiple family units developed from 1985-89 averaged almost 17 units per net acre in the urban area--about 80% of allowable densities. Table 3-2 shows the distribution by county: Clackamas 76%, Multnomah 67%, Washington 85%.

For all land inside the UGB (urban plus urbanizable):

Multiple family development accounted for about 54% of all new units between 1985 and 1989. This finding supports assumptions made in the adopted findings for the metropolitan UGB: that future development would be split 50/50 between single family and multiple family dwelling units.

The average single family density was 4.9 units per acre; the range was 4.2 in Clackamas County to 5.2 in Washington County.

Single family units were built in subdivisions at an average of about 65% of allowable density: Clackamas 93%, Multnomah 75%, Washington 66%.

B. LIVABILITY ISSUES

Below we address the preservation of urban livability issue by describing changes in housing affordability, traffic congestion, and air quality in the metropolitan case study area between 1985 and 1989. For parkland, we looked only at the Beaverton subarea.

The average home sales price in Portland increased by about 33% between 1985 and 1989. The average home selling price in the Portland metropolitan area increased from $70,015 to $92,763 between 1985 and 1990. The largest increases occurred in (1) Oregon City/Mollala, (2) Tigard-Wilsonville, and (3) West Portland.

Average multiple family rental rates in the Portland area increased by about 32% between 1985 and 1989. Rental rates increased the most during this period in (1) Milwaukie/Oregon City, and (2) Tigard/Lake Oswego.

Both the average home selling price and the average monthly rental rates for multiple family dwelling units in the Portland metropolitan area grew at a slightly faster rate between 1985 and 1988 than did per capita income in the metropolitan area. While both home prices and monthly rents increased by about 30 percent over this period, per capita income in the metropolitan area increased by about 25 percent over the same period. Though income data for 1989 are not available, our guess is that housing prices will be shown to have increased faster than incomes during that period.

Traffic congestion is increasing in the Portland area. Between 1985 and 1989, level of service (LOS) decreased on all highway links we examined. On many links, LOS decreased from LOS E to LOS F (LOS F is the lowest level of service ranking, indicating severe traffic congestion). All links had a LOS of D or lower in 1989. Traffic volumes also increased on all links between 1985 and 1989.

The number of "good" days for air quality in Portland increased by about 22% between 1985 and 1988. "Good" days increased from 186 in 1985 to 227 in 1988. "Unhealthful" increased from 5 in 1985 to 6 in 1988.

In our Beaverton subarea, total park acreage in the Tualatin Hills Parks are Recreation District (THPRD) increased by about 6 percent between 1985 and 1989. Total park acreage in THPRD increased by 50 acres from 900 to 950 acres between 1985 and 1989. The number of park sites also increased from 100 to 125 from 1985 to 1989.

The evidence about "liveability" in Portland compared to other western U.S. cities is mixed, though generally favorable. When compared to seven other western U.S. cities of similar size (Sacramento, Seattle, St. Louis, Denver, San Francisco, Phoenix, and Tucson), Portland's population, population density, employment per acre, and daily round-trip commute time are all less than the average for each of these urban density measurements. Portland has more city-owned park acres per 1,000 residents (24.2) than most of the seven other cities. Although Portland is expected to have a lower urban freeway congestion severity index (total delay/million vehicle-miles of travel) over the next decade than most of the other seven comparable cities, the index is expected to grow five times greater by 2005 because delays are expected to increase much faster than vehicle-miles.

APPENDIX
DESCRIPTION AND EVALUATION OF DATA

A. PREFACE

This appendix describes and evaluates the data we used to address urban growth issues in the Portland case study area. We focus on data that describe changes in land development and livability between 1985 and 1989.

We organize the appendix by data source. For each source we describe the data source, evaluate its reliability, and show the data. We organize the data into six categories, corresponding to the six sections of this appendix:

1.0 Data describing historic socioeconomic conditions

2.0 Data describing growth management policies

3.0 Data describing changes in land development

4.0 Data describing changes in livability indicators

5.0 Data describing residual development potential

6.0 Data comparing Portland to other urban areas

In Chapter Three we use the data in this Appendix to develop conclusions about the amount and type of urban growth that occurred between 1985 and 1989 in the Portland case study area.

1.0 SOCIOECONOMIC INDICATORS

1.1 SOURCE *Population Estimates for Oregon 1980-89*, Portland State University Center for Population Research and Census, 1990; *Business and Employment Outlook*, State Employment Division, 1990.

Description Population estimates for each case study area and Oregon for the years 1980 and 1989 (by Portland State University's Center for Population Research and Census (CPRC). Estimates are driven by area births, deaths, and net migration. Table A-1 shows historic population growth for the Portland case study area and other case study areas across Oregon. Employment estimates for each case study area and Oregon for the years 1980 and 1988. Table A-2 shows historic employment growth for the Portland metropolitan area and counties within other case study areas across Oregon.

Evaluation The population estimates by the CPRC are the best available. Although the CPRC does not actually count people, it periodically updates the data to ensure a close approximation to actual population trends. The 1980 Census of Population is used as a base. Employment data are extrapolated from the Bureau of Economic Analysis (BEA), U.S. Department of Commerce, and Oregon unemployment insurance files. The BEA estimates are the best available for time-series analysis. The BEA's employment data for each county are estimated jointly, and thus are comparable with one another.

ANALYSIS Tables A-1 and A-2 below show that the population of Portland and metropolitan counties grew at faster rates between 1980 and 1989 than for the state as a whole. All other counties of our study, and the state as a whole, had a greater rate of employment growth between 1980 and 1988.

TABLE A-1

POPULATION GROWTH
1980-89

Jurisdiction	1980	1989	Change	% Change
Medford	39,746	45,290	5,544	13.95
Jackson County	132,456	145,000	12,544	9.47
Portland	368,139	432,175	64,036	17.39
Washington, Clackamas, and Multnomah	1,050,418	1,114,500	64,082	6.10
Bend	17,263	19,510	2,247	13.02
Deschutes County	62,142	70,600	8,458	13.61
Brookings	3,384	4,465	1,081	31.94
Curry County	16,992	19,200	2,208	12.99
Statewide Total	2,633,156	2,791,000	157,844	5.99

Source: Population Estimates for Oregon 1980-89, Portland State Center for Population Research and Census, 1990.

TABLE A-2

EMPLOYMENT GROWTH
1980-88

Jurisdiction	1980	1988	Change	% Change
Jackson County	56,560	66,470	9,910	17.5
Portland Metro	595,600	618,200	22,600	3.8
Deschutes County	27,340	34,330	6,990	25.6
Curry County	6,230	8,730	2,500	40.1
Statewide Total	1,188,000	1,343,000	155,000	13.1

Source: Oregon Resident Labor Force, State Employment Division, 1990.

2.0 GROWTH MANAGEMENT POLICIES AND REGULATIONS

2.1 SOURCES Interviews with Brent Curtis of the Washington County planning staff and Larry Conrad of the City of Beaverton planning staff. Washington County's "Urbanization" policies and Article V (Public Facilities and Services) of the county development code were also reviewed.

ANALYSIS **There are 27 jurisdictions in the Portland metropolitan area, each of which has a growth management program. We focus on describing, in general terms, the growth management programs of** the City of Beaverton and Washington County.

The Portland Metropolitan Urban Growth Boundary

In 1977, LCDC required that a common urban growth boundary (UGB) be established for the 24 cities in the Portland Metropolitan region. This boundary was intended to accommodate growth through the year 2000.

As the regional planning agency, the Metropolitan Service District (Metro) was assigned the responsibility for working with Multnomah, Clackamas and Washington Counties and affected cities to establish and prepare findings to justify the regional UGB. This growth boundary was modified, conditioned and finally approved by LCDC in 1979.

Under a coordination contract with DLCD, Metro also reviewed the comprehensive plans of cities and counties under its jurisdiction for compliance with LCDC goals and Metro's growth management policy guidelines. Early in the LCDC acknowledgment process it was determined that cities would plan for their city limits only--and that counties would develop "complementary" plans for unincorporated areas between city limits and the regional UGB.

This meant that each of the three metropolitan counties prepared comprehensive plans that provided for urban levels of development outside of city limits. It also meant that a high level of coordination was required between cities and counties on how urbanization would take place in areas that may ultimately be annexed to cities. In Washington County, "planning area agreements" were negotiated with each city and approved by Metro and LCDC. Among other things, these agreements spelled out how cities could comment on near-by developments, and how county zones would be converted to city zones upon annexation.

The Portland Metropolitan Area has scores of special districts that provide fire protection, sewer, water and other services such as recreation. Over the last several years many of the smaller districts were merged with some of the larger districts. In Washington County the Wolf Creek Water District now serves a much larger area than any of the individual cities. The Unified Sewerage Agency serves all of Washington County and the Board of County Commissioners is the board of that sewerage agency. The Tualatin Hills Recreation District provides services to Beaverton and much of the unincorporated urbanized areas. Despite the importance of these and smaller special districts in the urbanization process, there was no State requirement that special districts be a party to planning area agreements.

Finally, each city and county within the UGB was required to comply--through zoning--with minimum density standards (ranging from six to ten units per net buildable acre, depending on the size of the jurisdiction) and to allow for at least 50% of all dwelling units to be attached or multiple family. Despite the fact that local zoning allows for higher densities

through PUD and other density transfer provisions, market demand has maintained average lot sizes in the 8,000 to 10,000 square foot range.

Washington County

Washington County had by far the largest area of undeveloped urbanizable land of the three counties in the Portland Metropolitan Area. Because of this fact, Washington County was required by LCDC to preserve vacant land within the UGB and to prevent it from being cut up into small parcels that result in inefficient development patterns.

One of the conditions of "acknowledgment" of the UGB was that Washington County develop special growth management policies for urbanizable land. The intent of these policies was to retain agricultural land in large productive blocks until urban services could be provided to accommodate urban (as opposed to rural) levels of development. These policies remained in effect until the Washington County Comprehensive Framework Plan (CFP) was acknowledged by LCDC in 1983.[1]

Washington County's basic growth management policy is relatively simple: development (except for single family residences on lots of record) is prohibited unless urban services can be provided. The County requires a 10-acre minimum lot size for unserviced areas within the planning areas of cities.

Growth Management Policy 14 categorizes urban facilities and services as "critical" (public water, sewer, fire, drainage and local access)," "essential" (schools, major streets, transit improvements, police protection and sidewalks), and "desirable" (parks, pedestrian and bicycle paths and public transportation). Critical services are required for development approval. Essential services are generally required within five years of development approval. Desirable services may be required as a condition of development approval.

One of Washington County's most pressing growth management problems has been coordinating the provision of services with cities and special districts. Policy 14(f) calls for the County to prepare a "unified capital improvements plan, program and budget" which serves as a basis for setting service area priorities. This unified program is intended to be updated annually. If public facilities are extended at the developer's cost and meet County standards as outlined above, then the development may proceed.

Washington County does not mandate minimum densities. So, despite the fact that the County provides for relatively high subdivision densities in its development regulations, lots of 9,000 square feet (rather than the 5,000 square feet typically allowed by zoning) are the norm. Similarly, single family residential development often occurs on land planned and zoned for multiple family use. Thus, market pressures appear to be causing development at densities below those allowable by zoning, which could result in inefficient land use and premature UGB expansion.

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[1]In "specially regulated areas" (SRA's), Washington County prohibited land divisions prior to the provision of fire protection, sanitary sewer, public water and local street services. Building permits for single family residences were limited to lots of record at the time of County acknowledgment. In industrially-designated areas, the County established a 30-acre minimum lot size, until modified by application of the "Special Industrial District."

Outside the UGB, Washington County does not regulate development activity with the intent of preserving land in large parcels for future UGB expansion. When reviewing partitions, for example, zoning determines the minimum lot size. If rural services are available, there are no additional requirements for siting of dwellings or other development. The County does have a PUD ordinance that allows for clustering of development, which could have the effect of reserving large, undeveloped portions of property for future urbanization.

Boundary Commission

The three-county Portland Metropolitan Area also has a Boundary Commission, a State agency whose mission is to make sense out of overlapping and sometimes competing service areas for special districts and cities. The Portland Metropolitan Area Boundary Commission reviews changes in boundaries of cities and special service districts.

One of the major effects of the Boundary Commission's actions has been the enlargement of some special service districts and the elimination of some smaller districts. As special districts have become larger and more efficient, they have been able to successfully compete with cities in providing services to both incorporated and unincorporated areas within the regional UGB.

Beaverton

Beaverton's pre-acknowledgment comprehensive plan extended beyond its City Limits into urbanizable Washington County. However, this plan was never adopted by Washington County. Beaverton, like other metropolitan cities, has a "city limits only" acknowledged plan.

Since acknowledgment, Beaverton has been working with Washington County, Tigard and Portland to establish "urban service," or potential annexation areas. The goal is to negotiate agreements with Washington County, neighboring cities and special districts to ensure that development occurs under City auspices within the Beaverton planning area.

The City of Beaverton requires annexation and the coordinated provision of key urban services before urban development can occur. Development on individual sewage disposal systems is not permitted. The City's efforts at managing growth through the annexation process has been frustrated by State annexation laws (which make annexation difficult) and by the availability of services provided by the large special districts that service Washington County. Virtually all residential development in Beaverton has occurred through the subdivision (single family) or site plan review (multiple family) processes.

Partitioning activity inside the City does not appear to be a problem. Beaverton's partitioning ordinance requires that parcelization be consistent with the future efficient use of land, and prohibits serial partitioning activity. The high cost of land within the Portland Metropolitan Area makes it impractical to develop large home sites through the partitioning process. Because land in and around Beaverton is expensive, it is most cost effective to develop it with sewer and water services provided by sewerage agencies or through annexation.

Recently, the city of Beaverton has been working with Washington County to bring their two transportation plans for arterial and collector streets into mutual conformance. Prior to the last few years there had been competing, sometimes conflicting, transportation plans. Conflicts between the two plans had been worked out through the development approval process, as opposed through the legislative planning process, the way it occurs now.

Beaverton has been successful in recent years in negotiating service area agreements with special service districts. There are actually four water districts that serve Beaverton and the surrounding area, all of which purchase water from the City of Portland. Beaverton has negotiated intergovernmental agreements with three of those districts and is working on one with the fourth. Agreements for service provision have been arranged with the Unified Sewerage Agency (USA) which manages the treatment plant for much of the urbanizable area in Washington County. The City controls connection to the system within the City Limits.

3.0 LAND DEVELOPMENT DATA

3.1 SOURCE *Metropolitan Service District Underlying Zone Database, 1985-89. Intergovernmental Resource Center Transportation Analysis Zone Database, 1985-88.*

Description The database consists of data on 1806 underlying zones (UZs) covering the three-county Portland metropolitan area. UZs, defined for transportation planning purposes, aggregate to census tracts. The data include residential building permits issued, 1985-1989; employment and population estimates, 1985 and 1988; land area in each comprehensive plan designation; and land area in each political jurisdiction.

The IRC database contains data on 123 Transportation Analysis Zones (TAZ's). TAZ's, defined for transportation planning purposes, aggregate to census tracts. The data by TAZ include employment and population estimates 1985 and 1988, land area, and land area in each zoning designation.

Evaluation Metro collects building permit data from the jurisdictions that issue the permits, then geocodes the data to UZ. The data is reliable at the census tract and larger jurisdiction level, but less reliable at the UZ level and for rural areas.

To produce annual population estimates, Metro updates 1980 census data by multiplying the number of occupied dwelling units by the average number of individuals per dwelling unit. Metro updates the number of dwelling units using residential building permit and demolition data. Metro estimates dwelling unit vacancies using data supplied by the U.S. Postal Service and Portland General Electric. Metro estimated the number of individuals per dwelling unit by survey in 1985. For later years Metro adjusts the individuals per dwelling unit estimate until the Metro population estimate agrees with PSU population estimates. Population is allocated to Uzs in proportion to the housing stock.

To produce the 1985 and 1989 population estimates, IRC updates 1980 census data by multiplying the number of dwelling units by the average number of individuals per dwelling unit. IRC coded the 1980 census block group data to TAZ's. IRC collects building permit data by census tract, then allocates these to TAZ's according to development pattern. Addition of the 1980 census estimate of the number of dwelling units to 1981 through 1988 building permit data gives estimates of 1985 and 1988 housing units by TAZ. Dividing the Washington State Office of Financial Management Forecasting Division Clark County population estimate by the number of dwelling units gives an estimate of the average number of individuals per dwelling unit. IRC adjusts this average in proportion to the 1980 census ratios of individuals per dwelling unit.

Metro estimates employment using unemployment insurance data from the State Employment Division. Metro geocodes this data to the census tract level, then allocates employment to Uzs in proportions constant over time.

To produce the 1988 employment estimates, IRC updated an employment database developed in 1985. IRC developed the 1985 database by filling in a partial list of employers in Clark County purchased from the Dun & Bradstreet Company. IRC updated the 1985 database in 1988 using several sources and surveys. The database does not include self-employment which is estimated to be about 7% of total employment.

The Metro and IRC databases are the best sources of population, employment, and building data covering the entire metropolitan area that we could find. The two databases are quite comparable as the IRC estimates population and employment for Clark County in a manner very similar to Metro's process.

METHOD

We use the Metro and IRC data first to define four analysis areas, then to show the amount and location of growth in the study area.

We divided the study area into four analysis areas: urban, urbanizable, urban fringe, and the rest of the urban region. These analysis areas are defined on the basis of (1) the density of development in 1985, and (2) location with respect to the UGB. The urban area consists of Uzs containing high density development inside the UGB in 1985. The urbanizable area consists of the remaining Uzs within the UGB. Uzs outside and within about a mile of the UGB define the urban fringe. The rest of the urban region consists of the remaining Uzs in the three metropolitan counties.

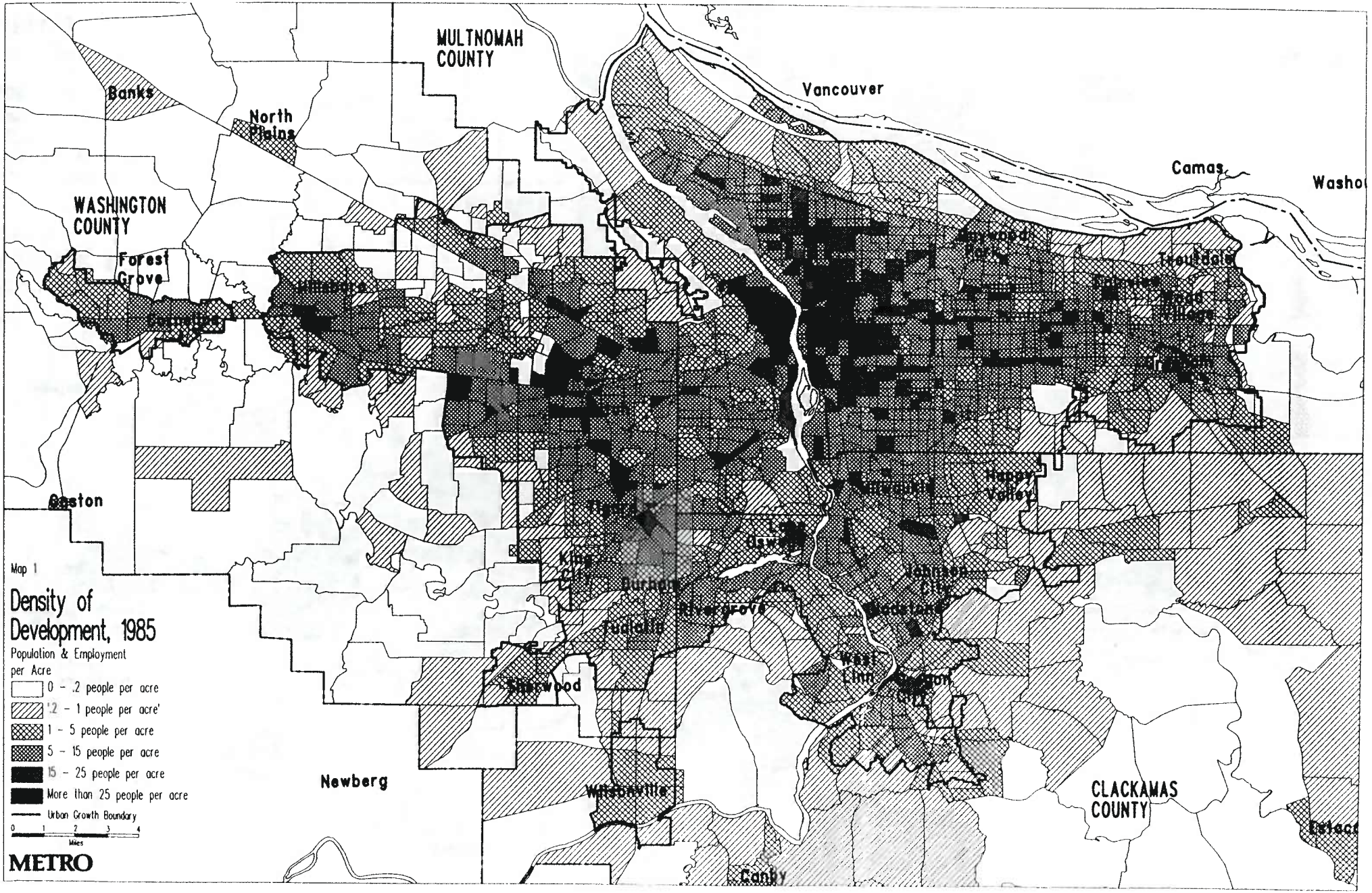
We tried three measures of development density to define urban and urbanizable land: population per acre, employment per acre, and population plus employment per acre. Metro provided the land area of each UZ in acres. We subtracted the number of acres in Open Space/Natural Environment zone. Land in this zoning category is generally not developable. The results are shown on Maps 1 through 3. We chose population plus employment per acre as the best proxy for development density because of its intuitive appeal and because the resulting pattern appeared to coincide well with the actual pattern of development.

Next, we reduced the number of density classes inside the UGB and identified the Uzs constituting the urban fringe. Map 4 shows (1) the number of density classes reduced to three inside the UGB and (2) the urban fringe. We cannot show the urban fringe precisely because many UZs are split by the UGB. Referring to Map 1 and Map 4 we consulted with Metro staff to define the urban area as the area with densities of 5 or more people (population plus employment) per acre. We included some UZs developed at densities less than 5 people per acre to make the urban area more continuous for mapping. Map 5 shows the final definition of analysis areas.

Note that (1) the analysis areas are defined based on densities in 1985 (because we want to measure change since 1985), and (2) because UZs are large, gross density per acre is at best a crude measure of the amount of development and its inverse, vacant land. We would have preferred to define urban and urbanizable as based on built and vacant land, but those measures were not available.

With the analysis area defined we show the amount and location of development since 1985. Maps 6 through 10 show the distribution of residential building permit approvals by UZ, and the estimated changes in population and employment. Tables 3-1 through 3-6 show this data in more detail.

We followed a nearly identical process to define the analysis areas in Clark County using TAZs. The results are shown on Maps 11 through 14. Though not ideal, we used Clark County's urban service boundary in place of the UGB. A better method would involve first estimating, under the circumstances faced by Oregon planners, the location of a Clark County UGB had one been required, then defining our analysis areas with respect to the estimated line. We did not have the budget to draw that line so we used the existing line instead. The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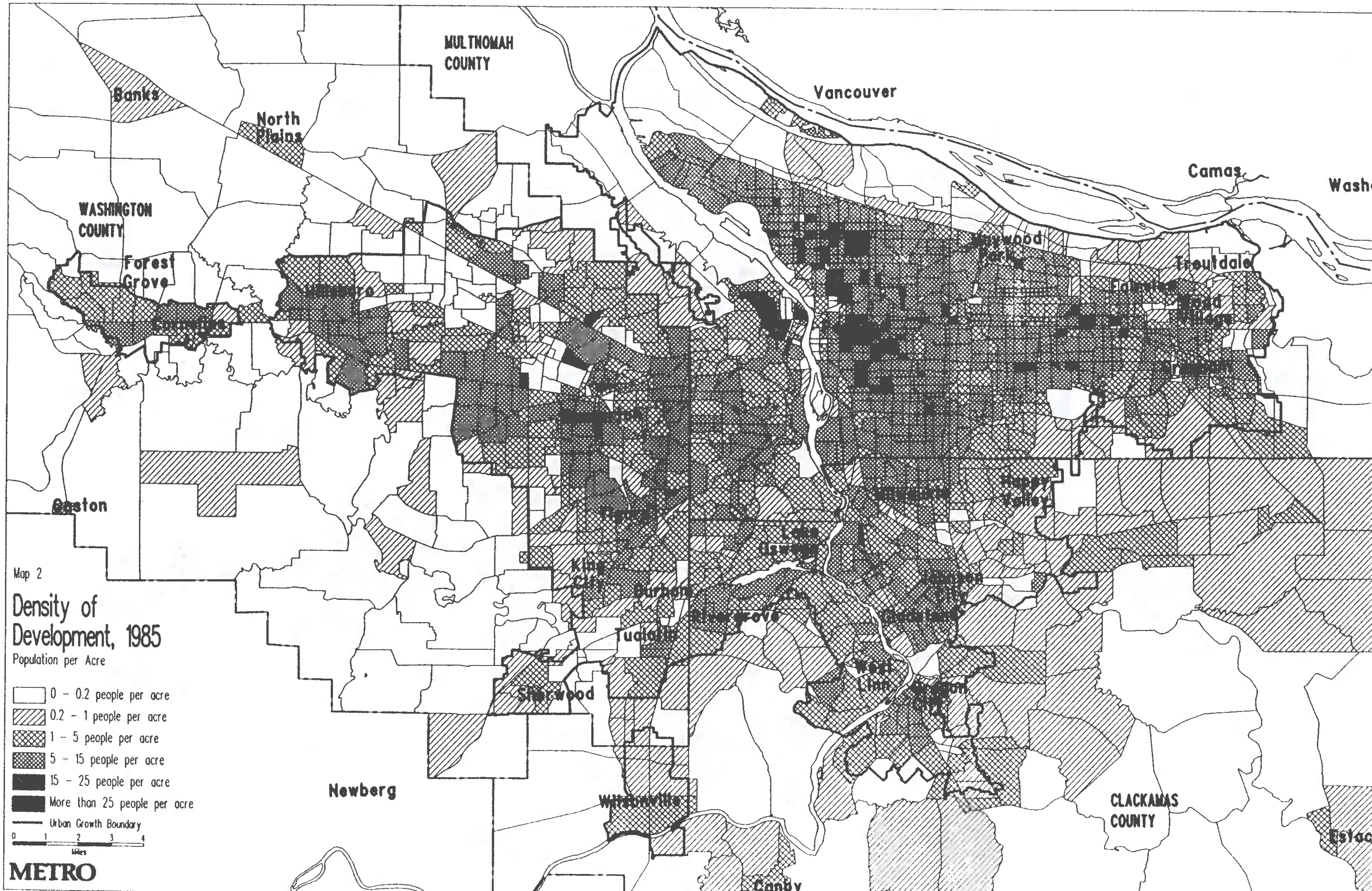
River Grove
Wilsonville
Canby
Happy Valley
Damascus
Troutdale
Gresham
Fairview
Wood Village
Portland
Map 1
Density of Development, 1985
Population & Employment per Acre
0 - .2 people per acre
.2 - 1 people per acre
1 - 5 people per acre
5 - 15 people per acre
15 - 25 people per acre
More than 25 people per acre
Urban Growth Boundary
0 1 2 3 4
Miles
METRO


Map 2
Density of Development, 1985
Population per Acre
0 - 0.2 people per acre
0.2 - 1 people per acre
1 - 5 people per acre
5 - 15 people per acre
15 - 25 people per acre
More than 25 people per acre
Urban Growth Boundary
0 1 2 3 4
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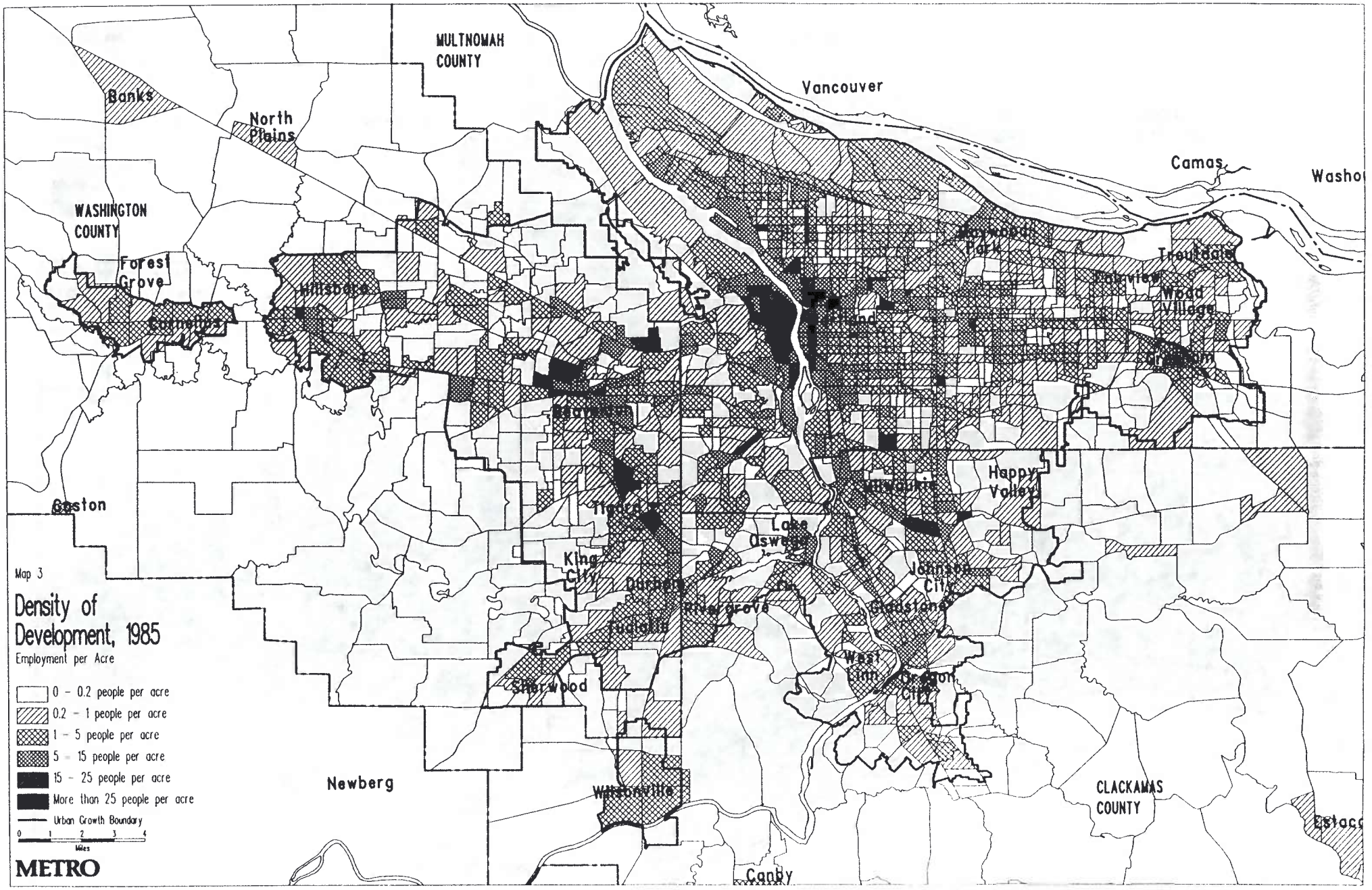
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CLACKAMAS COUNTY
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Map 3
Density of Development, 1985
Employment per Acre
0 - 0.2 people per acre
0.2 - 1 people per acre
1 - 5 people per acre
5 - 15 people per acre
15 - 25 people per acre
More than 25 people per acre
Urban Growth Boundary
0 1 2 3 4
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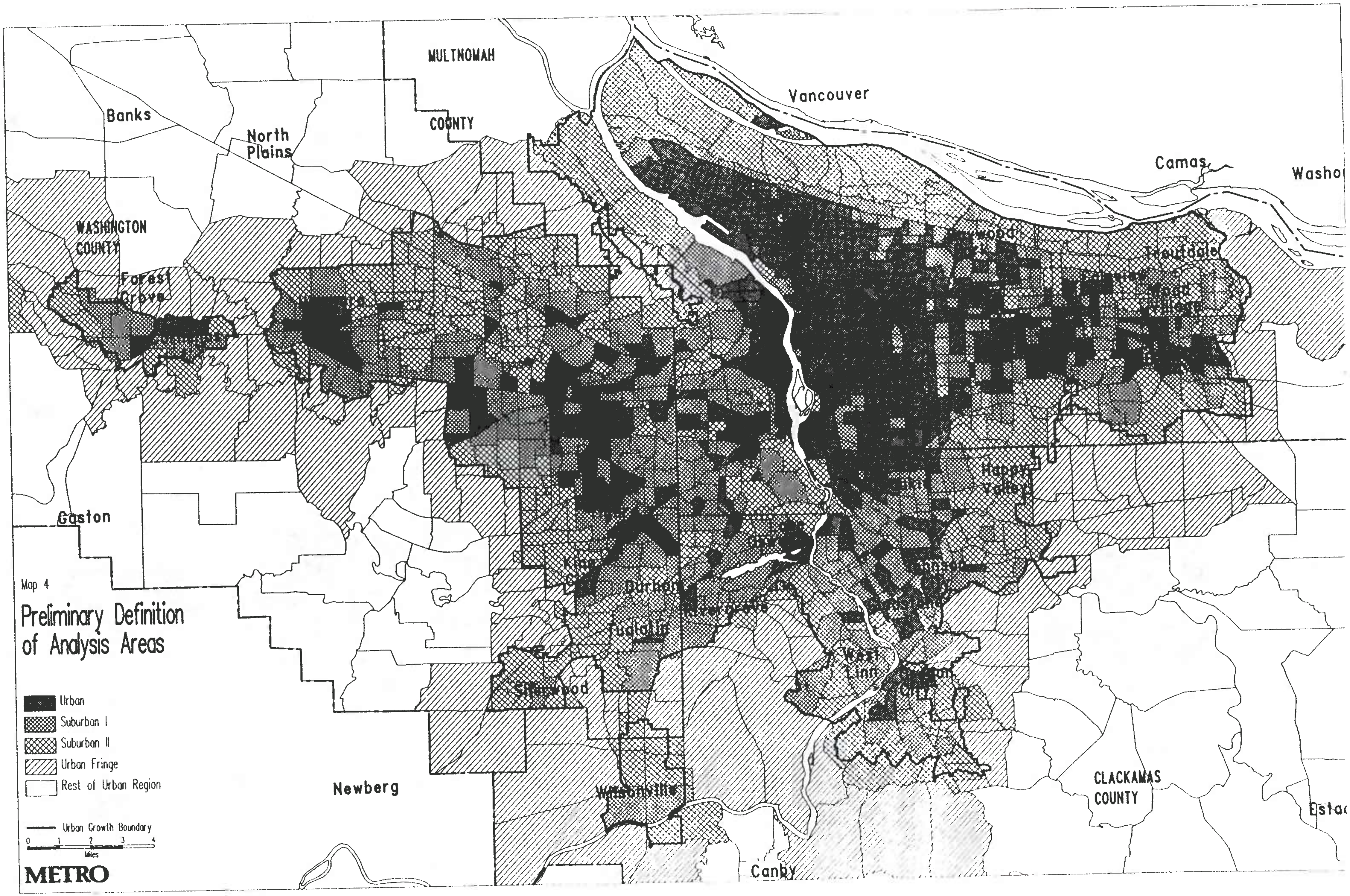
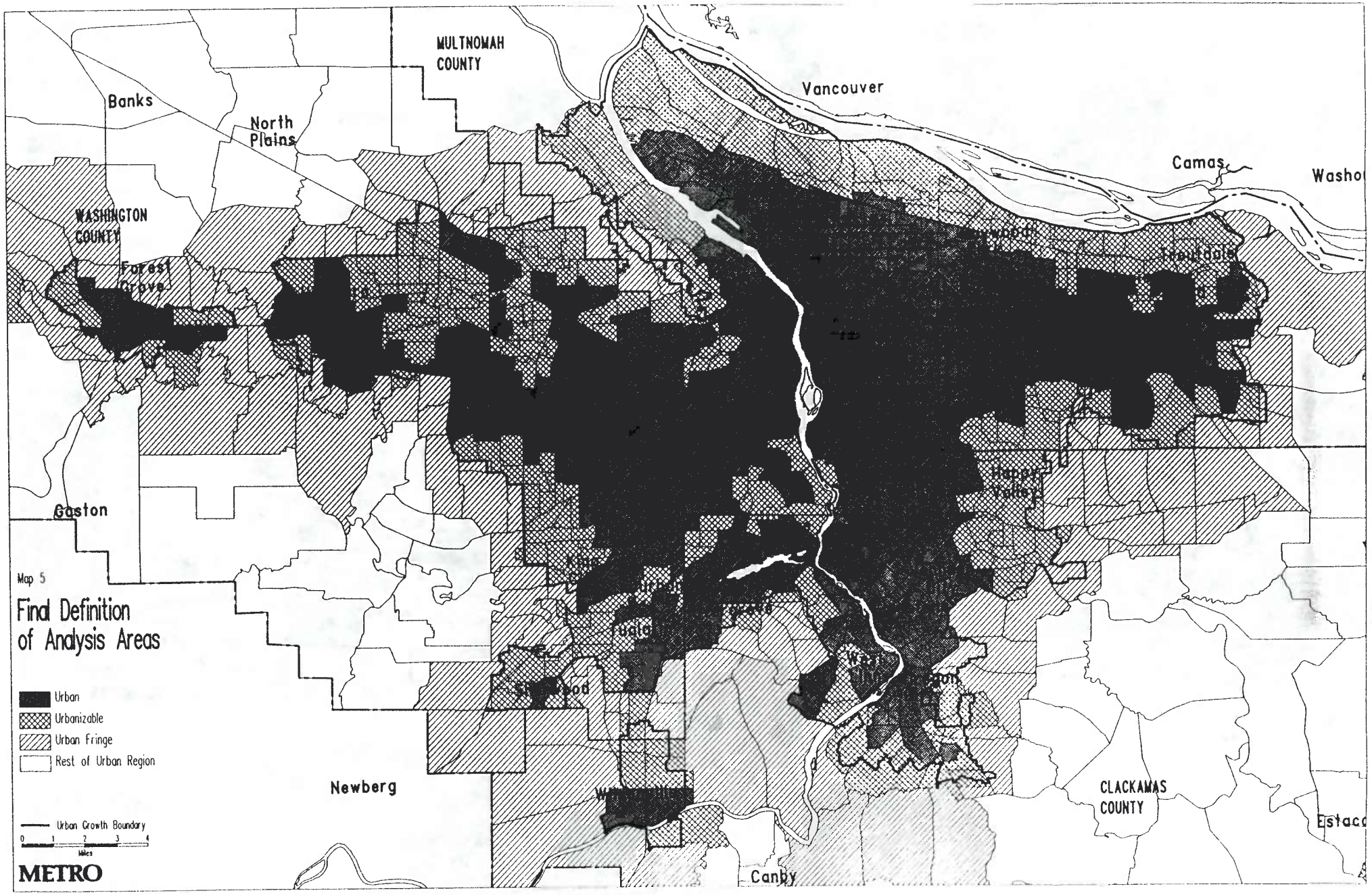


Map 4
Preliminary Definition of Analysis Areas


MULTNOMAH COUNTY
Banks
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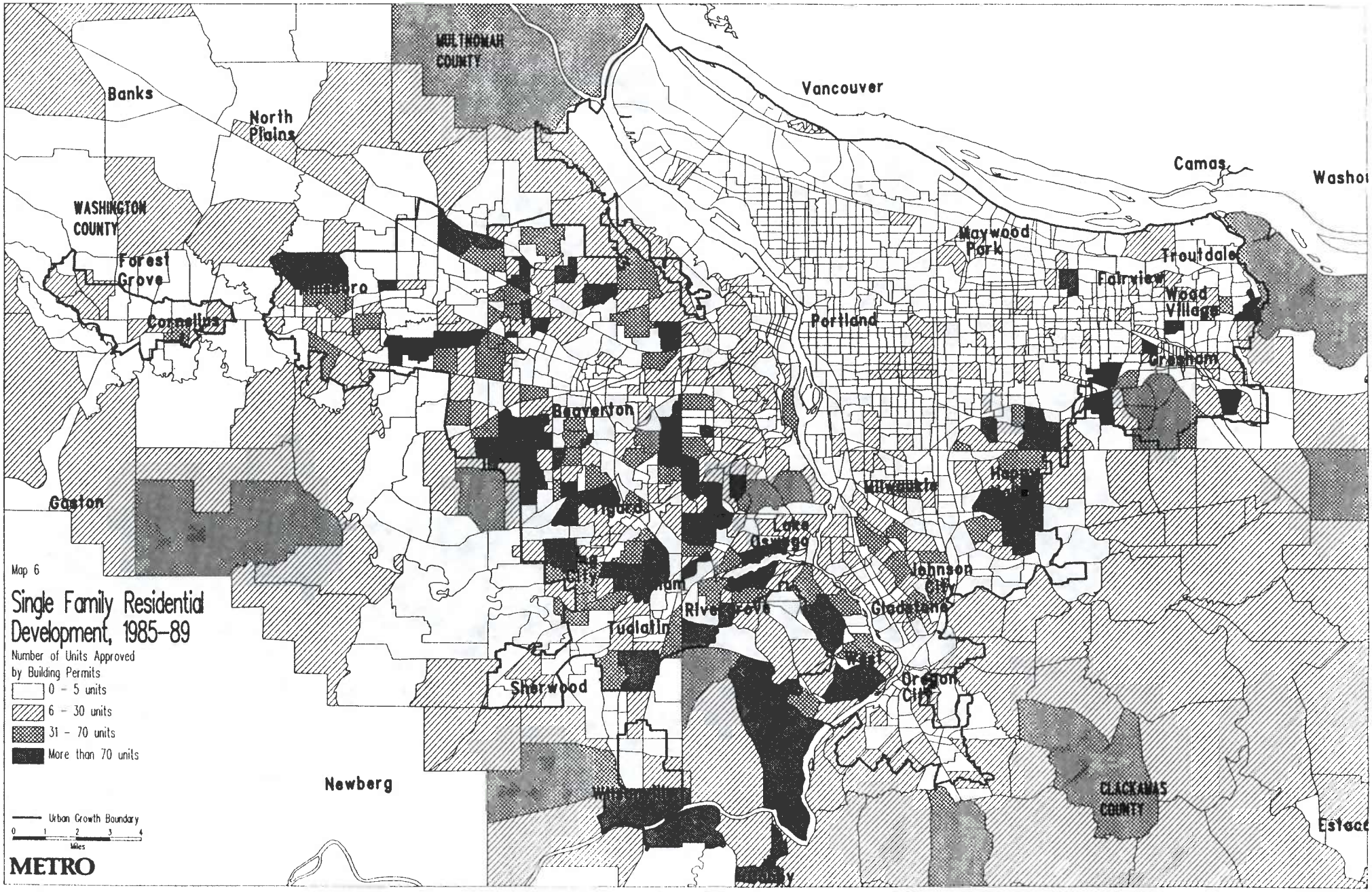
Vancouver
Camas
WASHINGTON COUNTY
Forest Grove
Gaston
Newberg
Canby
CLACKAMAS COUNTY
Map 5
Final Definition of Analysis Areas
Urban
Urbanizable
Urban Fringe
Rest of Urban Region
Urban Growth Boundary
0 1 2 3 4
Miles
METRO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Johnson City
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Oregon City
Newberg
CLACKAMAS COUNTY
Map 6
Single Family Residential Development, 1985-89
Number of Units Approved by Building Permits
0 - 5 units
6 - 30 units
31 - 70 units
More than 70 units
Urban Growth Boundary
0 1 2 3 4
Miles
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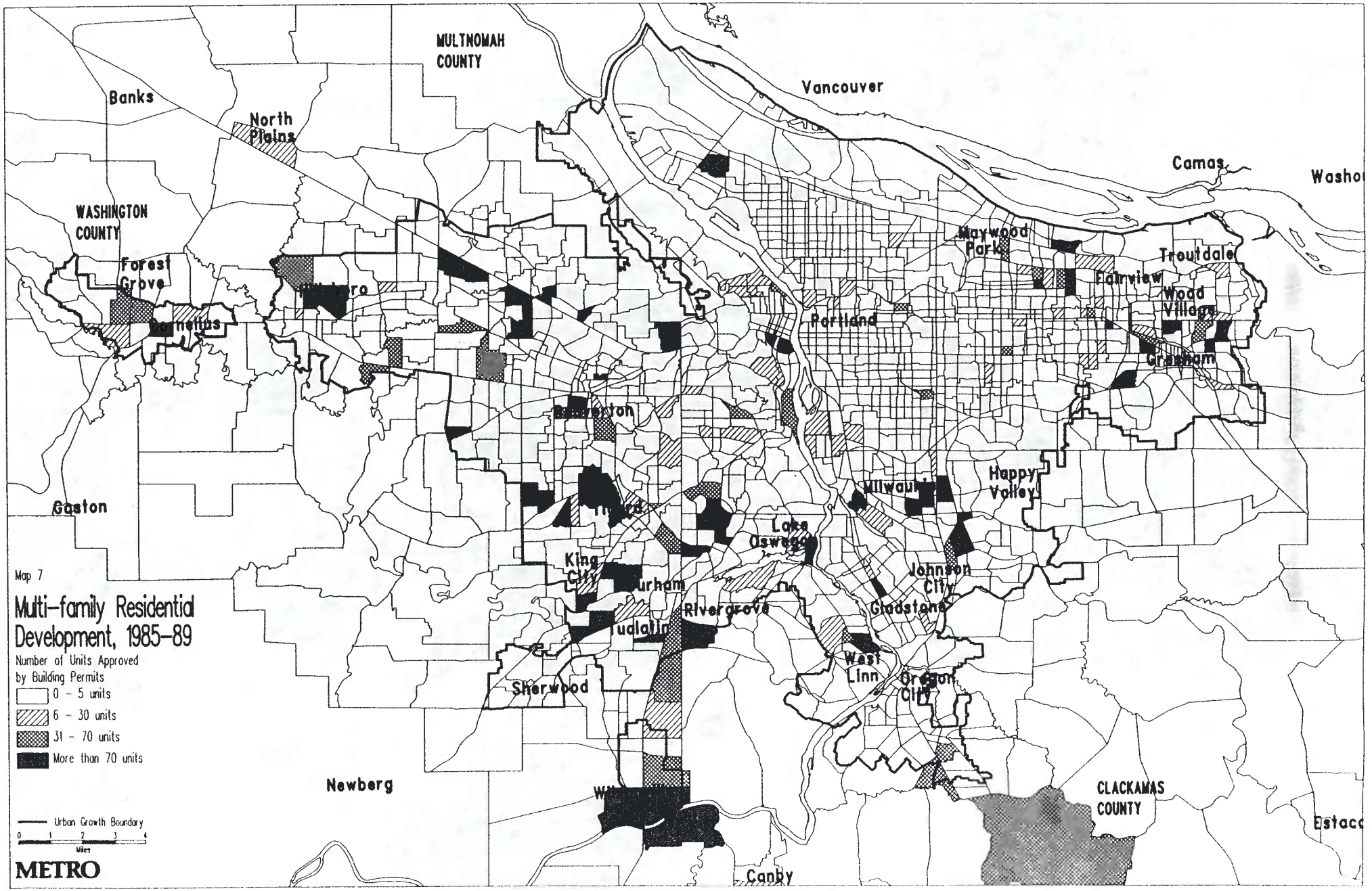
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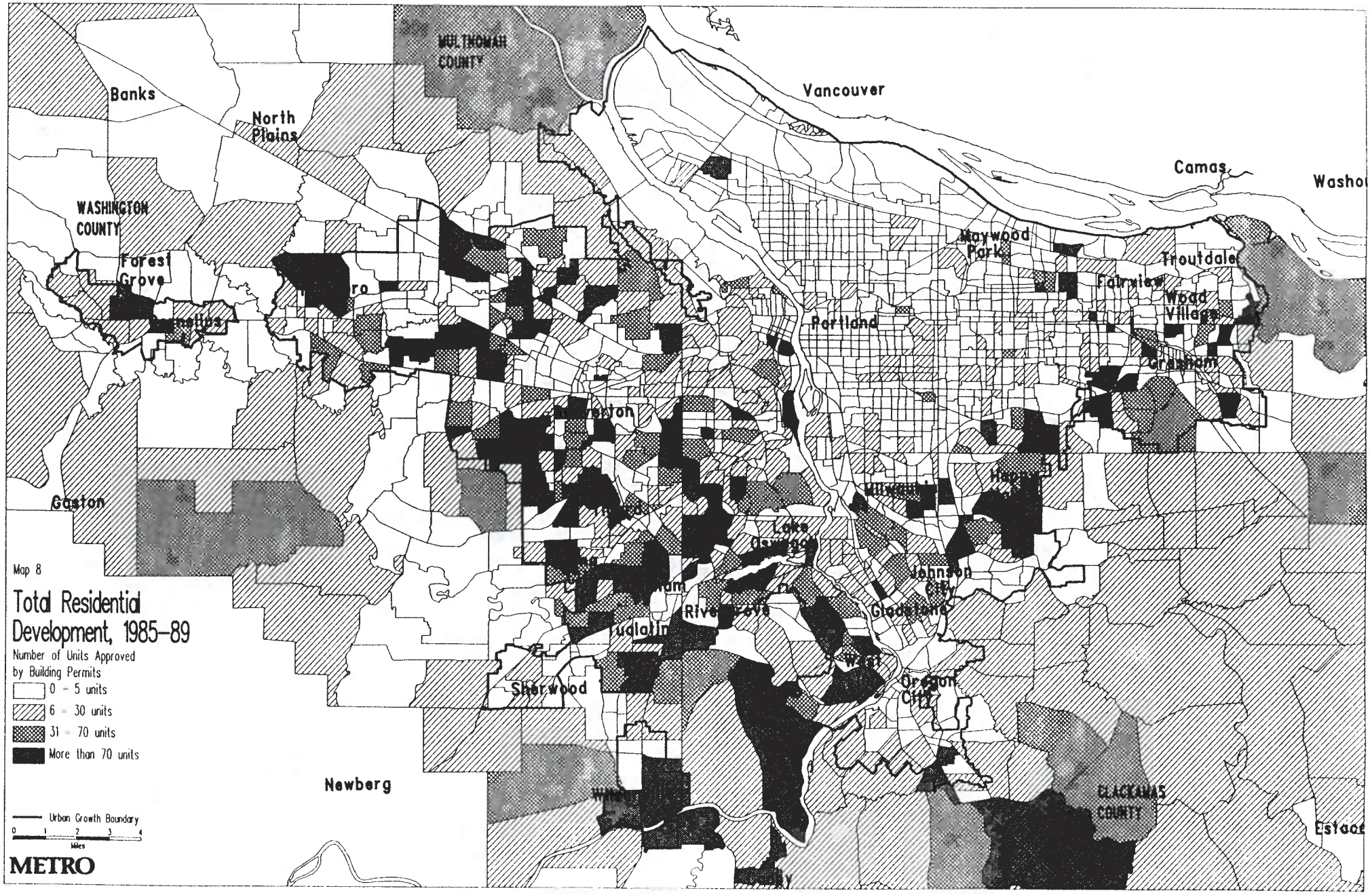
Newberg
CLACKAMAS COUNTY
Canby
Map 7
Multi-family Residential Development, 1985-89
Number of Units Approved by Building Permits
0 - 5 units
6 - 30 units
31 - 70 units
More than 70 units
Urban Growth Boundary
0 1 2 3 4
Miles
METRO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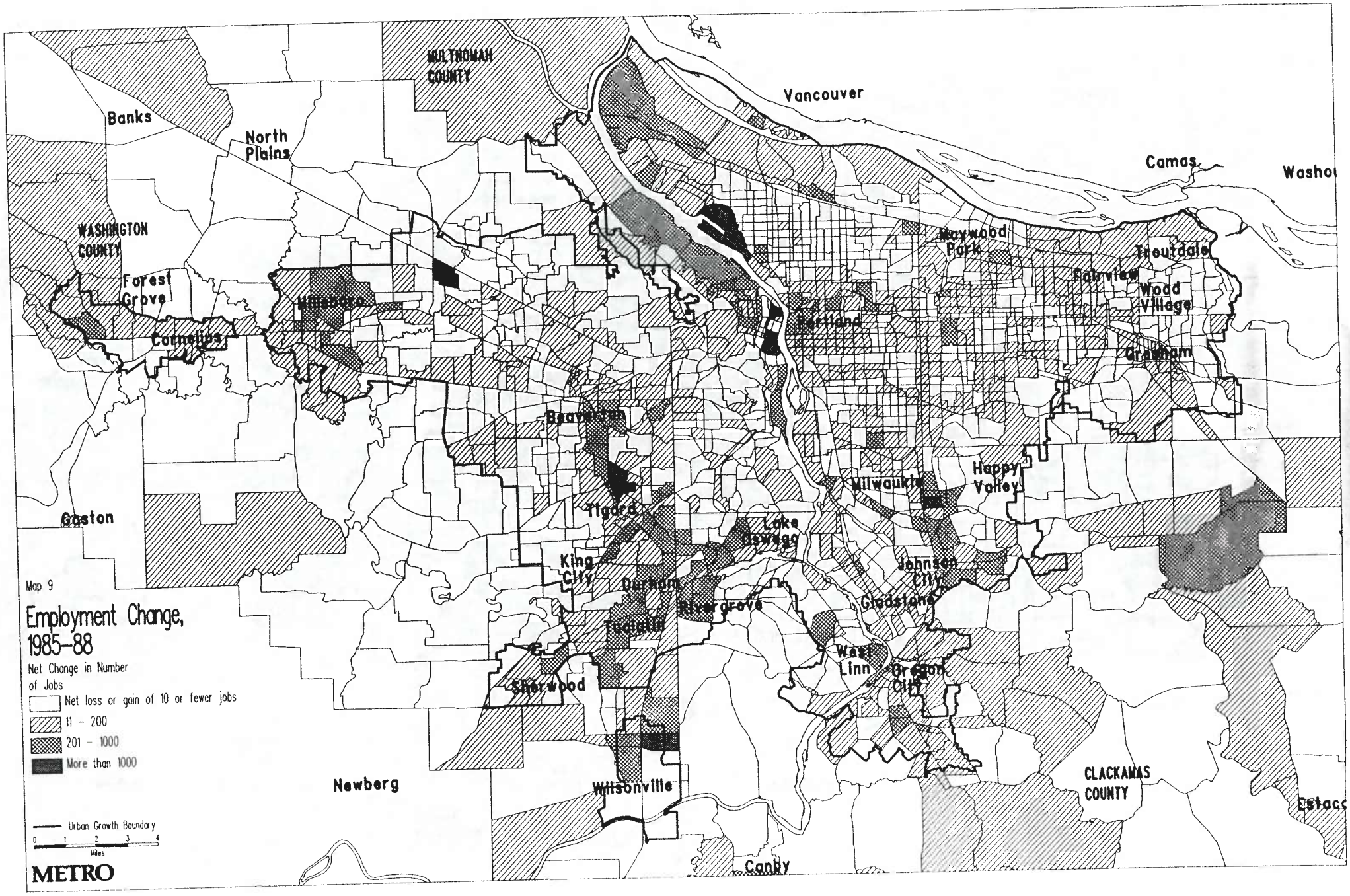
Sherwood
West Linn
Oregon City
Newberg
CLACKAMAS COUNTY
Map 8
Total Residential Development, 1985–89
Number of Units Approved by Building Permits
0 - 5 units
6 - 30 units
31 - 70 units
More than 70 units
Urban Growth Boundary
0 1 2 3 4
Miles
METRO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Beaverton
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Milwaukie
Happy Valley
Gaston
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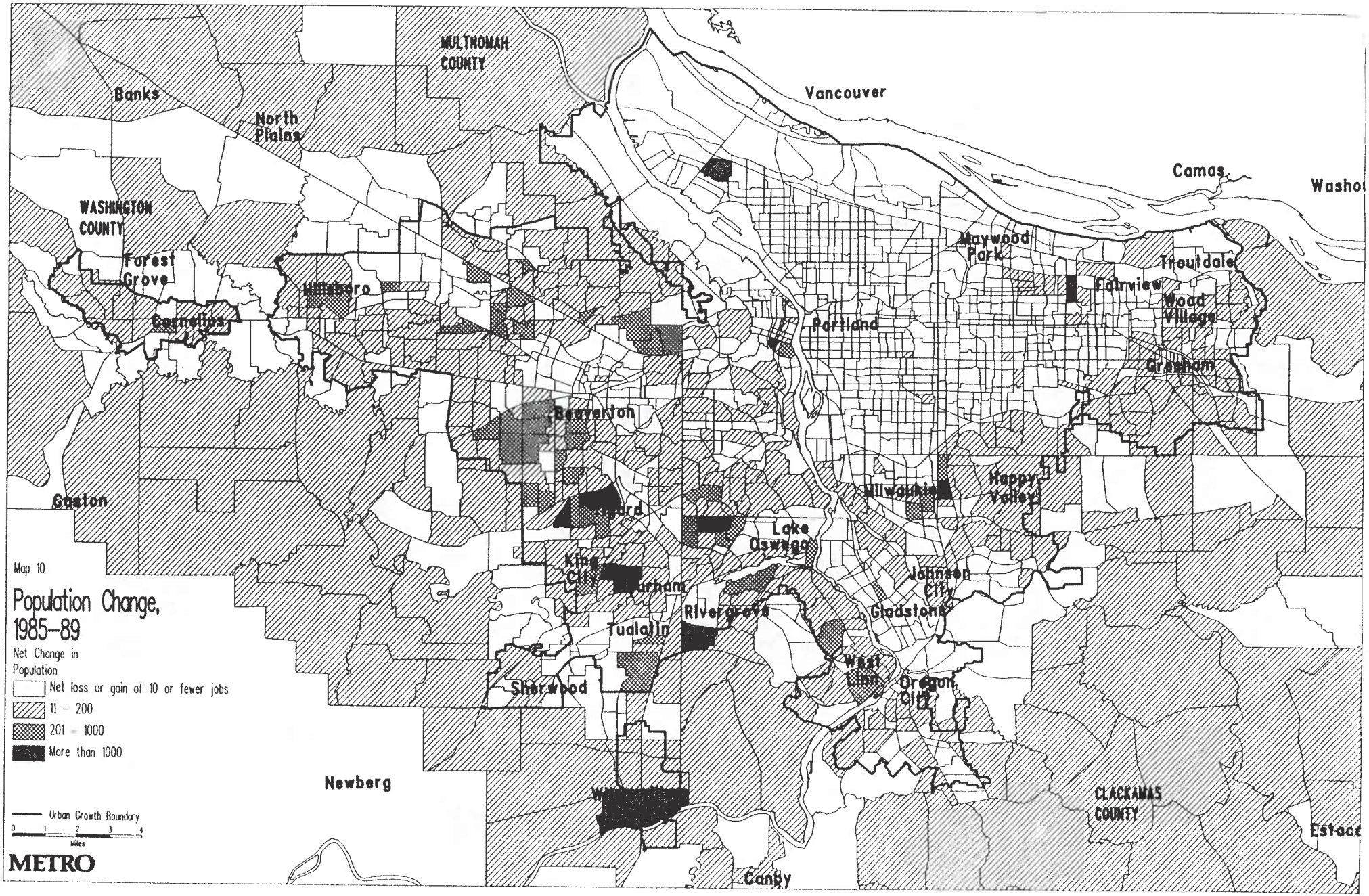
Tualatin
West Linn
Oregon City
Sherwood
Newberg
Wilsonville
CLACKAMAS COUNTY
Canby
Map 9
Employment Change, 1985–88
Net Change in Number of Jobs
Net loss or gain of 10 or fewer jobs
11 – 200
201 – 1000
More than 1000
Urban Growth Boundary
0 1 2 3 4
Miles
METRO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Gladstone
River Grove
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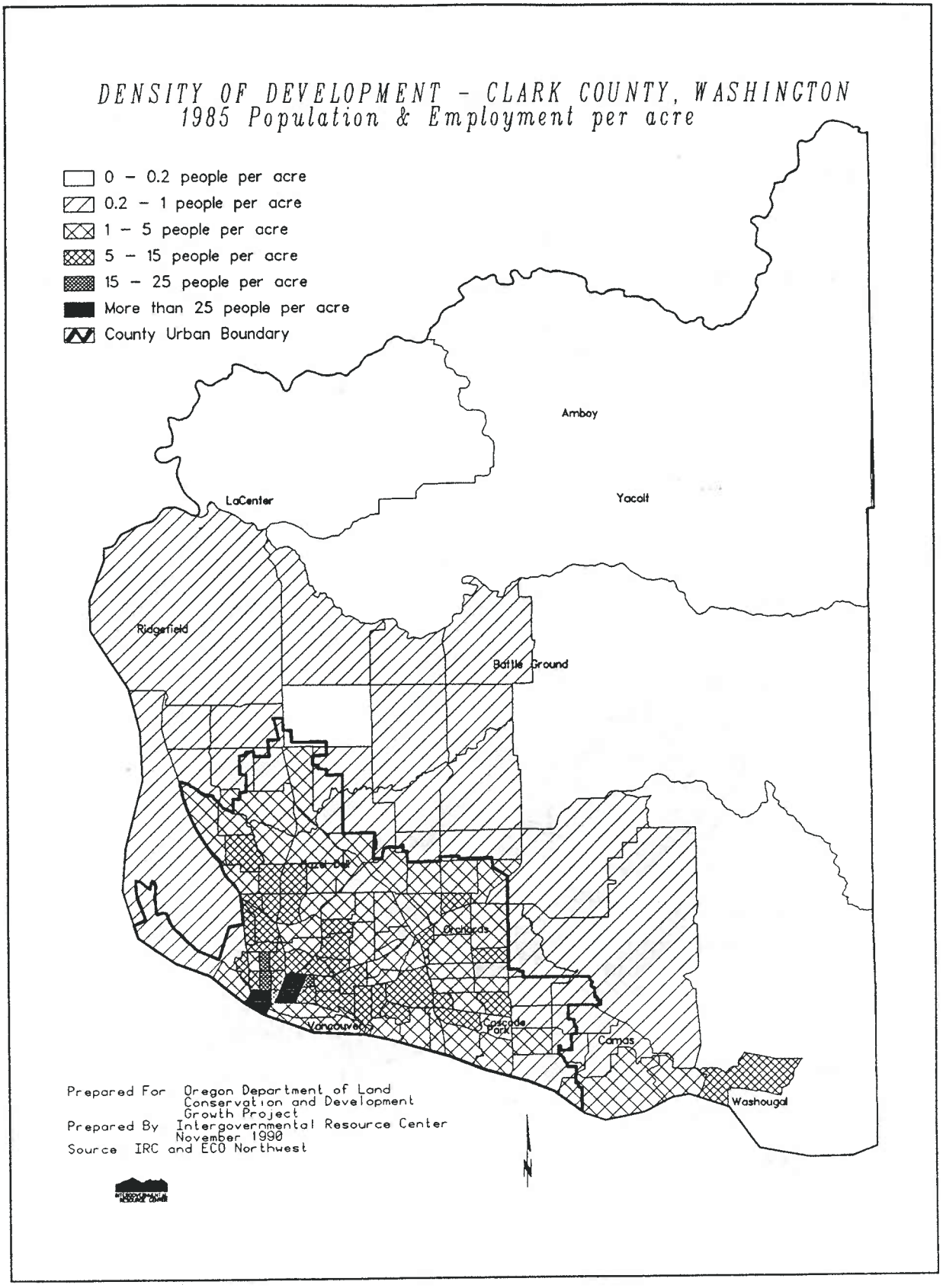
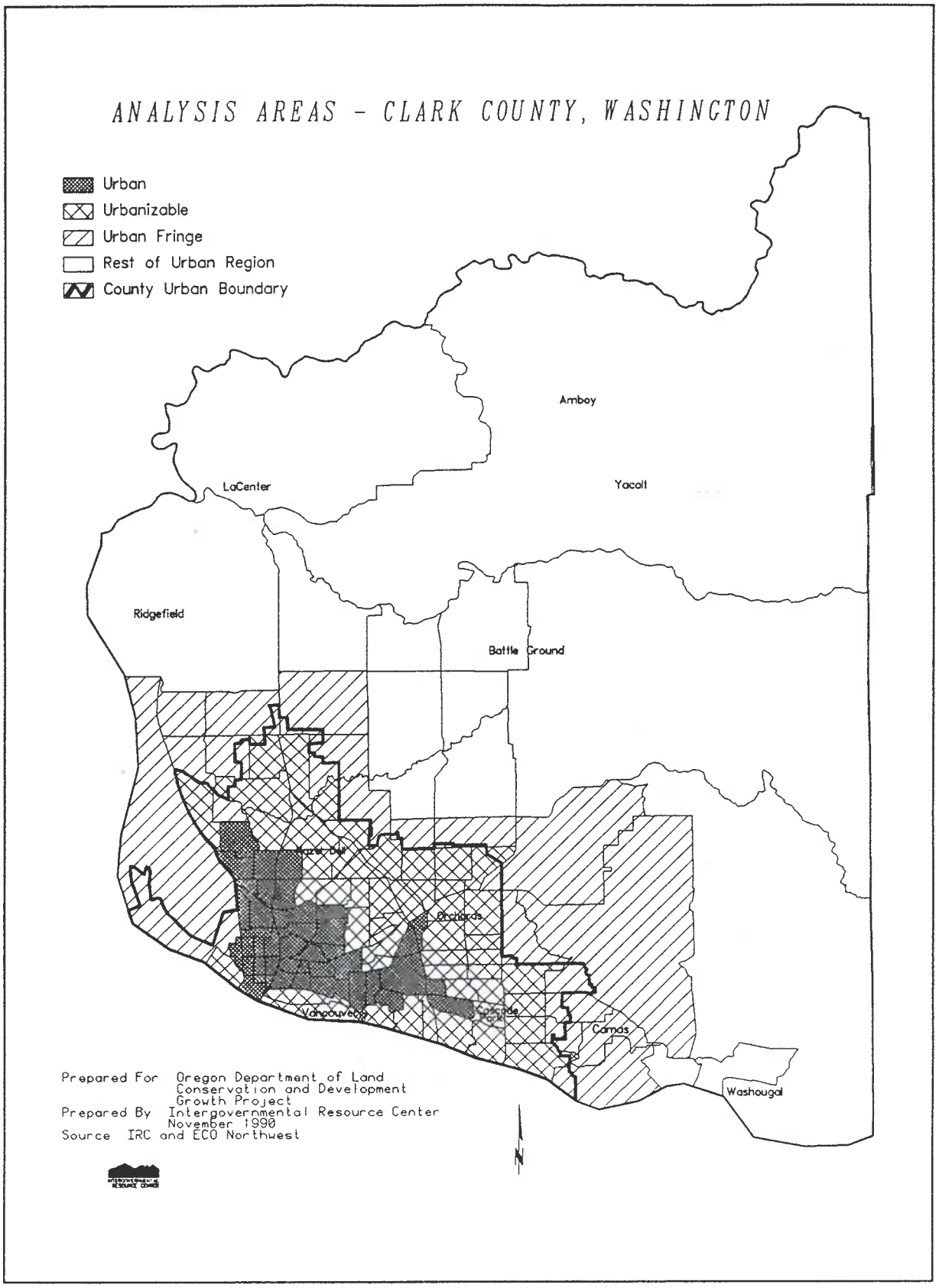
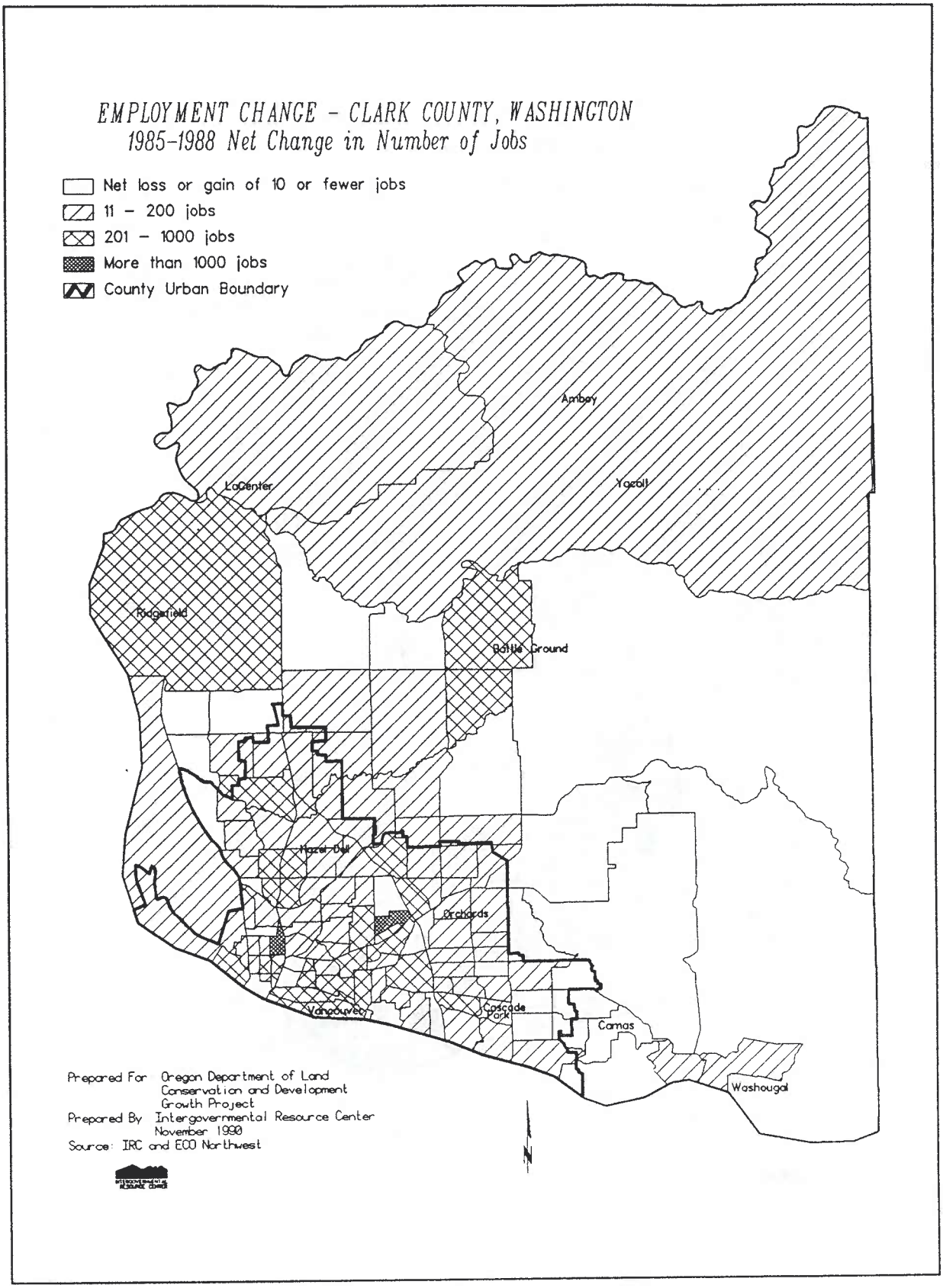
Oregon City
Sherwood
Newberg
CLACKAMAS COUNTY
Canby
Map 10
Population Change, 1985–89
Net Change in Population
Net loss or gain of 10 or fewer jobs
11 – 200
201 – 1000
More than 1000
Urban Growth Boundary
0 1 2 3 4
Miles
METRO

Map 11


DENSITY OF DEVELOPMENT - CLARK COUNTY, WASHINGTON
1985 Population & Employment per acre
0 - 0.2 people per acre
0.2 - 1 people per acre
1 - 5 people per acre
5 - 15 people per acre
15 - 25 people per acre
More than 25 people per acre
County Urban Boundary
Amboy
LaCenter
Yacolt
Ridgefield
Battle Ground
Orchards
Vancouver
Cascade Park
Camas
Washougal
Prepared For Oregon Department of Land Conservation and Development Growth Project
Prepared By Intergovernmental Resource Center November 1990
Source IRC and ECO Northwest

Map 12


ANALYSIS AREAS - CLARK COUNTY, WASHINGTON
Urban
Urbanizable
Urban Fringe
Rest of Urban Region
County Urban Boundary
Amboy
LaCenter
Yacolt
Ridgefield
Battle Ground
Orchards
Vancouver
Camas
Washougal
Prepared For Oregon Department of Land Conservation and Development Growth Project
Prepared By Intergovernmental Resource Center November 1990
Source IRC and ECO Northwest


EMPLOYMENT CHANGE - CLARK COUNTY, WASHINGTON
1985-1988 Net Change in Number of Jobs
Net loss or gain of 10 or fewer jobs
11 - 200 jobs
201 - 1000 jobs
More than 1000 jobs
County Urban Boundary
Ambey
LaCenter
Yacolt
Ridgefield
Battle Ground
Hazel Dell
Orchards
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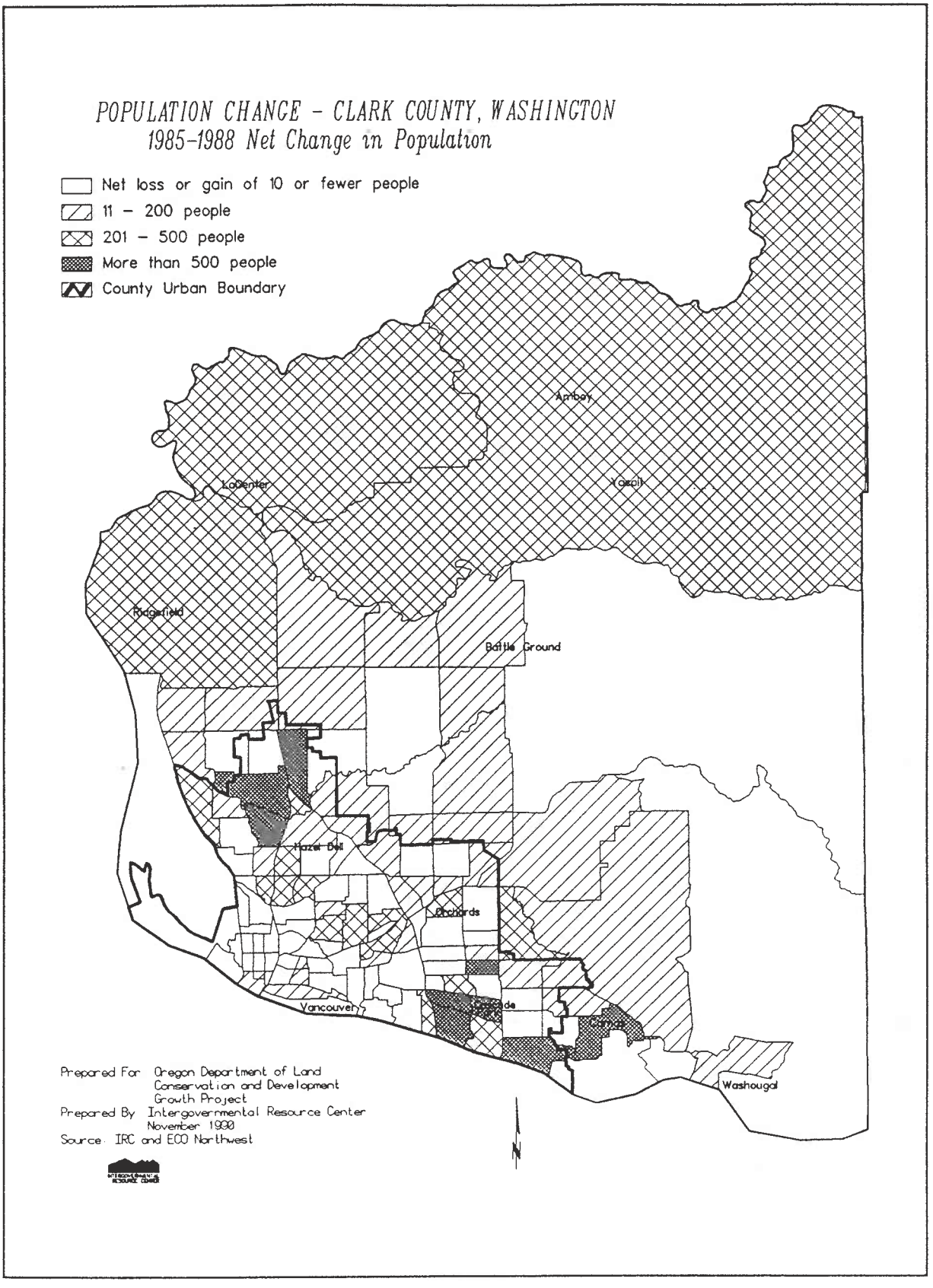
Source: IRC and ECO Northwest

Map 14


POPULATION CHANGE - CLARK COUNTY, WASHINGTON
1985-1988 Net Change in Population
Net loss or gain of 10 or fewer people
11 - 200 people
201 - 500 people
More than 500 people
County Urban Boundary
Amboy
Yacolt
LaCenter
Ridgefield
Battle Ground
Hazel Dell
Orchards
Vancouver
Washougal
Prepared For Oregon Department of Land Conservation and Development Growth Project
Prepared By Intergovernmental Resource Center November 1990
Source: IRC and ECO Northwest

Clark County maps and figures reported in this appendix should, therefore, be interpreted with care.

Table 3-1 shows population and employment by analysis area in 1985. Because Metro has population and employment data disaggregated only to the UZ level, UZs split by the UGB caused problems. To overcome this problem, we used 1984 aerial photographs to estimate the proportion of development inside the UGB. Population and employment estimates in UZs split by the UGB are multiplied by these proportions to develop the figures shown in Table 3-1. We were not able to use this procedure in Clark County with split TAZs. The problem is less severe in Clark County, however, because only eight TAZs are split by the urban service boundary.

Table 3-2 shows the changes in population and employment between the first quarter of 1985 and the first quarter of 1988 by analysis area (population and employment data are available only to 1988). We used 1989 aerial photographs to re-estimate the proportion of development inside the UGB in UZs split by the UGB. We allocated the changes in population and employment with respect to the UGB to obtain the new development proportions.

Table 3-3 shows the number of residential building permits issued from 1985 through 1989 by analysis area. This number is also reported as a percentage of the total number of dwelling units in 1985. These numbers do not include mobile-home permits. Metro's building permit records show location with respect to the UGB for each permit. Thus we adjusted totals for UZs split by the UGB by counting permits inside and outside the UGB for these UZs.

Table 3-4 shows the number of residential building permits issued by jurisdiction inside and outside the UGB. Metro generated this data using its building permit data base as opposed to the UZ data base they supplied us. Two aspects of the data reported in Table 3-4 cause concern. First, the rural versus urban totals differ from those reported in Table 3-3. Second, permits issued by cities are shown to fall outside the UGB. Conversations with Metro staff reveal that locating sites in rural areas often is difficult. We report both Tables 3-3 and 3-4 to show the limitations of the building permit data.

We attempted to use Metro's building permit database to estimate the proportion of rural (outside the UGB) residential development occurring in exception areas. We found that in each county, exception area and resource area residential zones are distinct. Given the zoning at each rural building site, we could have determined location in an exception or resource area. Unfortunately, the zoning information often was missing in the building permit database preventing us to develop a reasonably reliable estimate.

Table 3-5 shows the concentration of single family residential building permit activity by analysis area. For each analysis area each cell in the first column shows the number of UZs in which the number of building permits falls within the range shown in the left hand column. The cells in the second column show the number of UZs as a percent of the county total number of UZs falling within the analysis area. Split UZs again caused a problem. If building permits were issued for sites on both sides of the UGB in a split UZ, we split the UZ at the UGB. Thus some split UZs are counted twice: once for the part of their development inside the UGB and again for the part that occurred outside the UGB. The notes under Table 3-5 show the numbers of UZs counted twice in this way.

Table 3-6 shows the concentration of multiple family residential building permit activity by analysis area. The table reads like Table 3-5. The ranges in the left hand column give the number of dwelling units (e.g. apartments), not buildings. No UZ split by the UGB had multiple family development both inside and outside the UGB. Therefore, we counted each UZ only once to generate the data in Table 3-6.

ANALYSIS

Maps 6-10 show graphically several measures of development in the study area from 1985-89: single family, multiple family, and total residential development, employment and population. Maps 13 and 14 show changes in population and employment in Clark County. The following tables show the data in more detail.

Table 3-1 shows the location of people in 1985. In Multnomah and Washington Counties, the table shows population densities falling by an order of magnitude between the urban and urbanizable areas and again between the urbanizable area and the area outside the UGB. As footnote 3 and 4 show, excluding the large UZ 1805 east of Troutdale increases the urban fringe density in Multnomah County. Population density falls more slowly with distance from Portland in Clackamas County and the urban fringe population density in Clackamas County approaches the urbanizable area densities for the other counties. At the beginning of the study period the urban fringe is least developed in Washington County and most developed in Clackamas County. Using the Clark County urban services boundary as a proxy for the UGB, the development pattern in Clark resembles most closely that in Clackamas County. Comparison of Maps 1 and 11 reinforces the comparison of Clark County with Clackamas County. Employment densities follow a similar pattern in each county. In 1985, the counties' residential development densities differ but not employment densities.

Table 3-2 shows most of the residential development occurring in the area defined as urban which suggests, as we noted, that our urban area may be too big. The percentage changes, however, were not nearly as large in the urban as in the urbanizable area. Over half the growth in overall population occurred in Washington County while only about 10% located in Multnomah County. In Multnomah County and in Washington County, 95% of the population increase occurred inside the UGB. In Clackamas County 86% of the growth occurred inside the UGB and 5% occurred in the urban fringe. Although the total population increase in the remainder of the county is greatest in Clackamas County, the percentage increase is larger in the other counties. Note also that Canby and Sandy are included in the "rest of the urban region" estimates for Clackamas County.

Nearly all the growth in employment occurred inside the UGB. The number of jobs generally declined outside the UGB.

Table 3-2 shows the urban services boundary in Clark County to be less meaningful than the UGB in Oregon. About 28% of the population growth occurred outside the urban services boundary compared to about 5% in Oregon. The development outside the urban services boundary again corresponds most closely to that outside the UGB in Clackamas County. The changes in population and employment in Camas, a rapidly growing area as shown on Map 14, are included in the urban fringe figures in Table 3-2.

Because Metro bases population estimates on the number of dwelling units, Table 3-3 improves on Table 3-2 mainly by disaggregating multiple and single family development. In general, the number of new dwelling units was split evenly between single and multiple family development. Veterans of the metropolitan UGB process will remember that among the critical assumptions made in estimating land requirements for the UGB was that future build-

out would occur at roughly a 50/50 split. So far, it has. As expected, single family development constituted most of the development outside the UGB.

As indicated in the footnotes, incorporated areas outside the Portland UGB such as Sandy, Canby, and North Plains, cause problems in determining the amount of development inside versus outside the UGB. To help overcome this problem Table 3-4 shows building permits by jurisdiction. The footnotes in Table 3-3 show the effect of adjusting for development in cities outside the Portland UGB. Comparing Tables 3-3 and 3-4, however, reveals problems in the building permit database. To develop Table 3-3, we used the UZ database which Metro built by aggregating its building permit data base by UZ. Metro developed Table 3-4 by aggregating the same building permit database by jurisdiction and location with respect to the UGB. We should get the same rural/urban split in both tables. But even after adjusting Table 3-3 for incorporated areas outside the UGB, Table 3-3 shows 1928 single family dwellings outside the UGB while Table 3-4 shows 1747. Furthermore, dwellings outside the UGB should not be associated with incorporated areas. If we assume that all dwelling units associated with cities in Table 3-4 are actually inside the UGB, the total outside the UGB decreases to 1566. Thus we estimate between 1566 and 1928 of the 20,721 single family dwelling units built in the study area between 1985 and 1989 occurred outside the UGB (between 7.6% and 9.3%).

The County totals in Table 3-4 also do not correspond to those in Table 3-3. The reason is that some cities, such as Lake Oswego, cross county lines. We did not account for this in Table 3-4.

Adjusting Table 3-3 by subtracting 72 units (the number Table 3-4 shows as inside cities outside the UGB) brings Table 3-3 roughly in agreement with Table 3-4, which shows 155 multiple family units (or 0.7% of total multiple family development) built outside the UGB. Subtracting the remaining dwelling units shown outside the UGB but associated with cities leaves 91 units (0.4% of total) built outside the UGB.

Tables 3-5 and 3-6 show, in somewhat more detail, the information shown in Maps 6 and 7. In Multnomah County, no residential building occurred in most UZs. Most of the residential construction occurred away from downtown Portland but inside the UGB. As shown on Maps 6 and 7, Washington and Clackamas Counties experienced the most concentrated single family residential development. With some exceptions, most of the residential construction occurred near but inside the UGB. The map shows these exceptions which, not coincidentally, are primarily in exceptions areas.

TABLE 3-1

POPULATION AND EMPLOYMENT, 1985
Number of people

Measure/ County	Urban		Urbanizable[1]		Urban Fringe[1]		Rest of Urban Region		Totals
	People	Per acre[2]	People	Per acre	People	Per acre	People	Per acre	
Population									
Multnomah	525,415	7.70	28,007	0.67	8,191	0.057[3]	2,383	0.054	563,996
Washington	214,167	5.22	25,888	0.89	5,239	0.076	18,694	0.057	263,988
Clackamas	131,025	4.53	27,742	1.68	18,407	0.247	71,817	0.066	248,991
Clark[4]	74,917	6.10	67,452	2.15	24,284	0.415	36,746	0.200	203,399
Totals	945,524	6.28	149,089	1.26	56,121	0.162	129,640	0.080	1,280,374
Employment									
Multnomah	315,691	4.62	31,126	0.74	633	0.004[5]	203	0.005	347,653
Washington	102,070	6.44	13,814	0.47	1,706	0.025	3,627	0.011	121,217
Clackamas	60,796	2.10	6,868	0.42	3,179	0.043	14,227	0.013	85,070
Clark	27,381	2.23	15,402	0.49	5913	0.101	5,844	0.032	54,540
Totals	505,938	4.03	67,210	0.56	11,431	0.032	23,901	0.015	608,480

Source: Metropolitan Service District Underlying Zone Database

1 For UZs split by the UGB, to get an estimate of development inside the UGB we multiplied UZ total population and employment by an estimate of the proportion of development inside the UGB. We estimated the proportion of development inside the UGB using 1985 aerial photographs.

2 We calculated the number of people per acre using total acres in the UGB minus acres covered by large bodies of water.

3 Excluding the large UZ 1805, population density in the urban fringe is 0.44 people per acre.

4 We defined the Clark County analysis areas using the Clark County urban/rural service boundary as we used the UGB in the Oregon Counties. This is not strictly appropriate because Clark County planners located the urban/rural service boundary under circumstances differing from those faced by Oregon planners drawing the UGB. Therefore, the data reported above should be interpreted with caution.

5 Excluding the large UZ 1805, employment density in the urban fringe is 0.03 people per acres.

TABLE 3-2

POPULATION AND EMPLOYMENT CHANGE, 1985-1988
Number of people

Measure/ County	Urban		Urbanizable[1]		Urban Fringe[1]		Rest of Urban Region		Totals
	Total Chnge	%[2] Chnge	Total Chnge	% Chnge	Total Chnge	% Chnge	Total Chnge	% Chnge	
Population									
Multnomah	2097	0.4	2169	7.8	146[3]	1.8	78[4]	3.3	4,490
Washington	16900	7.9	7163	27.7	182	3.5	947	5.1	25,192
Clackamas	7812	6.0	3454	12.5	594	3.2	1193	1.7	13,053
Clark	-1736	-2.3	9710	14.4	2693	11.1	439	1.2	11,106
Totals	25,073	2.6	22,496	15.1	3,615	6.4	2,657	2.1	53,840
Employment									
Multnomah	36608	11.6	3757	12.1	-303	-47.9	126	62.1	40,188
Washington	14123	13.8	6249	45.2	-313	-18.3	-548	-15.1	19,511
Clackamas	8262	13.6	6380	92.9	-123	-3.87	-482	-3.4	14,037
Clark	7726	28.2	8228	53.4	-102	-1.73	1557	26.6	17,409
Totals	66,719	13.2	24,614	36.6	-841	-7.36	653	2.7	91,145

Source: Metropolitan Service District Underlying Zone Database

[1] For UZs split by the UGB, to get an estimate of development inside the UGB in 1988 we multiplied total UZ population and employment in 1988 by an estimate of the proportion of development inside the UGB in 1988. We estimated the proportion of development inside the UGB from 1989 aerial photographs.

[2] We used the estimates reported in Table 3-1 as the base to calculate percentage change.

[3] Population in the large UZ 1805 east of the UGB along the Columbia River increased by 152 people outside the UGB. Net population change for the rest of the Multnomah County urban fringe area is, therefore negative.

[4] Population in the large UZ 1804 west of the UGB along the Columbia River increased by 64 people outside the UGB. Net population change for the rest of the exurban area of Multnomah County is, therefore, 14.

TABLE 3-3

RESIDENTIAL BUILDING PERMITS, 1985-89
Number of Dwelling Units

Measure/ County	Urban		Urbanizable		Urban Fringe		Rest of Urban Region		Totals
	DUs[1]	% Chnge[2]	DUs	% Chnge	DUs	% Chnge	DUs	% Chnge	
Single Family									
Multnomah	3158	2.13	1290	11.7	138[3]	5.07	55[4]	6.27	4641
Washington	5197	9.18	3977	54.5	150	7.69	298[5]	4.85	9622
Clackamas	2772	6.83	2234	26.6	425	7.01	1027[6]	4.39	6458
Subtotals	11127	4.53	7501	28.1	713	6.64	1380	4.54	20,721
Multiple Family									
Multnomah	4682	5.43	589	16.5	0	0	0	0	5271
Washington	5393	16.9	5530	222.0	0[7]	121.1	12[8]	3.83	10935
Clackamas	4435	36.4	1622	86.1	0	0	176[9]	6.21	6228
Subtotals	14510	11.1	7741	97.1	0	121.1	183	5.91	22434
Totals	26637	7.08	15242	43.9	713	6.99	1563	4.67	43155

Source: Metropolitan Service District Underlying Zone Database

1 The number of single family dwelling units does not include the number of mobile home permits.

2 We calculated the percent change using the number of single family and multiple family dwelling units existing at the beginning of 1985. For UZs split by the UGB, we estimated the number of existing dwelling units by multiplying the total number of dwelling units in the UZ by the proportion of development inside the UGB in 1985.

3 In the large UZ 1805 east of the UGB along the Columbia River, 46 single family building permits were approved outside the UGB.

4 In the large UZ 1804 west of the UGB along the Columbia river, 32 single family building permits were approved outside the UGB.

5 A total of 8 permit sites fell within an incorporated city outside the urban fringe area (e.g., Gaston, North Plains, etc.). See Table 3-4.

6 A total of 157 permit sites fell within an incorporated city outside the urban fringe area (e.g., Canby, Sandy, etc.). See Table 3-4.

7 The Underlying Zone database shows building permits approved for 40 multiple family units in the Washington County urban fringe. Washington County officieals report that no multiple family permits were issued for sites outside UGBs during the study period.l The 40 units are included in the urbanizable area of Washington County.

8 This development occurred in North Plains (see Table 3-5)

9 A total of 60 multiple family dwelling unit sites fell within an incorporated city outside the urban fringe area (e.g. Canby, Sandy, etc.). See Table 3-5.

TABLE 3-4

RESIDENTIAL BUILDING PERMITS BY JURISDICTION, 1985-89
Number of Dwelling Units

Jurisdiction	Single Family[1]		Multiple Family[2]		Totals		
	Outside UGB	Inside UGB	Outside UGB	Inside UGB	Outside UGB	Inside UGB	% Out UGB
Clackamas	1154	5099	101	6394	1255	11493	9.8%
Barlow	1[3]	0	0	0	1	0	100.0
Canby	47	115	0	12	47	127	27.0
Estacada	4	3	26[3]	0	30	3	90.9
Gladstone	1	50	0	15	1	65	1.5
Happy Valley	0	60	0	0	0	60	0.0
Lake Oswego	5	1459	0	1500	5	2959	0.2
Milwaukie	1	232	0	264	1	496	0.2
Molalla	22	1	0	4	22	5	81.5
Oregon City	0	74	0	232	0	306	0.0
Sandy	36	38	2	44	38	82	31.7
West Linn	0	969	0	173	0	1142	0.0
Wilsonville	0	514	4	1169	4	1683	0.2
Clackamas Unincorporated	1037	1584	69	2981	1106	4565	19.5
Multnomah	192	4369	6	4766	32	8490	0.4
Fairview	0	44	0	2	0	46	0.0
Gresham	5	1140	0	2230	5	3370	0.2
Portland	20	2531	0	2303	20	4834	0.4
Troutdale	1	201	0	18	1	219	0.5
Wood Village	0	15	6	6	6	21	22.2
Multnomah Unincorporated	166	438	0	207	166	645	20.5
Washington	401	9501	48	11100	449	20601	2.1
Beaverton	2	1778	0	4324	2	6102	0.1
Cornelius	27	39	4	2	31	41	43.1
Durham	0	21	0	0	0	21	0.0
Forest Grove	0	102	12	359	12	461	2.5
Gaston	1	2	0	0	1	2	33.3
Hillsboro	1	1050	0	970	1	2020	0.1
King City	0	1	0	124	0	125	0.0

Jurisdiction	Single Family[1]		Multiple Family[2]		Totals		
	Outside UGB	Inside UGB	Outside UGB	Inside UGB	Outside UGB	Inside UGB	% Out UGB
North Plains	5	6	0	12	5	18	21.7
Sherwood	0	59	0	24	0	83	0.0
Tigard	2	1667	0	1504	2	3171	0.1
Tualatin	0	716	32	801	32	1517	2.1
Washington Unincorporated	363	4060	0	2980	363	7040	4.9
Totals	1747	18969	155	22260	1902	41229	4.4

Source: Metropolitan Service District Building Permit Database

[1] Single family building permits do not include mobile home permits.
[2] The multiple family numbers refer to dwelling units (e. g., apartments), not structures.
[3] As discussed in the text, permit sites outside the UGB should not be reported as falling within a city's jurisdiction. We report the data here as given and discuss the implications of inaccuracies in the text.

TABLE 3-5

CONCENTRATION OF SINGLE FAMILY RESIDENTIAL BUILDING PERMIT[1] ACTIVITY, 1985-89
Number of Underlying Zones

County/ Number of permits	Urban		Urbanizable		Urban Fringe		Rest of Urban Region		Totals
	SFR	%[2]	SFR	%	SFR	%	SFR	%	
Clackamas	188	100.0	80[9]	100.0	46[10]	100.0	56	100.0	370[11]
0	68	36.2	21	26.3	0	0.0	3	5.4	92
3-5	54	28.7	19	23.8	19	41.3	7	12.5	99
6-10	25	13.3	8	10.0	11	23.9	10	17.9	54
11-30	18	9.6	13	16.3	15	32.6	28	50.0	74
31-70	14	7.5	8	10.0	1	2.2	7	12.5	30
>70	9	4.8	11	13.8	0	0.0	1	1.8	21
Multnomah	860	100.0	135[3]	100.0	23[4]	100.0	6	100.0	1024[5]
0	539	62.7	72	53.3	10	43.5	3	50.0	624
3-5	212	24.7	33	24.4	8	34.8	1	16.7	254
6-10	47	5.5	5	3.7	3	13.0	0	0.0	55
11-30	43	5.0	14	10.4	0	0.0	1	16.7	58
31-70	11	1.3	4	2.7	2	8.7	1	16.7	18
>70	8	0.9	7	5.2	0	0.0	0	0.0	15
Washington	216	100.0	138[6]	100.0	73[7]	100.0	39	100.0	466[8]
0	63	29.2	48	34.8	33	45.2	8	20.5	152
3-5	55	25.5	36	26.1	30	41.1	16	41.0	137
6-10	16	7.4	12	8.7	7	9.6	6	15.4	41
11-30	34	15.7	13	9.4	3	4.1	8	20.5	58
31-70	28	13.0	11	8.0	0	0.0	1	2.6	40
>70	20	9.3	18	13.0	0	0.0	0	0.0	38
Totals	1264		353		142		101		1860[12]

Source: Metropolitan Service District Underlying Zone Database. See text for explanation of allocations to UZs.

1 The single family residential category does not include mobile home permits.
2 Percent of the total number of UZs in the analysis area in the county.
3 Includes 8 fringe UZs split by the UGB.
4 Includes 5 fringe UZs split by the UGB.
5 Includes 13 fringe UZs split by the UGB.
6 Includes 16 fringe UZs split by the UGB.
7 Includes 3 fringe UZs split by the UGB.
8 Includes 19 fringe UZs split by the UGB.
9 Includes 15 fringe UZs split by the UGB.
10 Includes 7 fringe UZs split by the UGB.
11 Includes 22 fringe UZs split by the UGB.
12 Includes 54 fringe UZs split by the UGB.

TABLE 3-6

CONCENTRATION OF MULTIPLE FAMILY RESIDENTIAL BUILDING PERMIT ACTIVITY, 1985-89
Number of Underlying Zones

County/ Number of permits	Urban		Urbanizable		Urban Fringe		Rest of Urban Region		Totals
	MFR	%	MFR	%	MFR	%	MFR	%	
Clackamas	188	100.0	65	100.0	39	100.0	56	100.0	348
0	156	83.0	59	90.8	39	100.0	51	91.1	305
3-5	8	4.3	0	0.0	0	0.0	1	1.8	9
6-10	4	2.1	0	0.0	0	0.0	1	1.8	5
11-30	4	2.1	0	0.0	0	0.0	0	0.0	4
31-70	1	0.5	1	1.5	0	0.0	3	5.4	5
>70	15	8.0	5	7.7	0	0.0	0	0.0	20
Multnomah	860	100.0	127	100.0	18	100.0	6	100.0	1011
0	785	91.3	119	93.7	18	100.0	6	100.0	928
3-5	17	2.0	1	0.8	0	0.0	0	0.0	18
6-10	13	1.5	3	2.4	0	0.0	0	0.0	16
11-30	19	2.2	0	0.0	0	0.0	0	0.0	19
31-70	10	1.2	2	1.6	0	0.0	0	0.0	12
>70	16	1.9	2	1.6	0	0.0	0	0.0	18
Washington	216	100.0	122	100.0	70	100.0	39	100.0	447
0	179	82.9	105	86.1	70	97.1	38	97.4	392
3-5	0	0.0	2	1.6	0	0.0	0	0.0	2
6-10	3	1.4	1	0.8	0	1.4	0	0.0	4
11-30	8	3.7	2	1.6	0	0.0	1	2.6	11
31-70	5	2.3	1	0.8	0	1.4	0	0.0	6
>70	21	9.7	11	9.0	0	0.0	0	0.0	32
Totals	1,264		314		127		101		1,806

Source: Metropolitan Service District Underlying Zone Database

3.2 SOURCE *Special subdivision database, Brent Bishop 1985-89.*
1000 Friends of Oregon 1990 Housing study database, 1985-89.

Description Brent Bishop of Great Northwest Management Company has developed a special database to monitor subdivision activity in the Portland metropolitan area. For this project we purchased and assisted in updating a portion of that database.

The database contains extensive information on all subdivisions built from 1985 through 1989. Data include year and location built, gross site acres, dedicated open space, street area, and net lot area. As part of their metropolitan housing study (in progress), 1000 Friends of Oregon, in return for free access to the data, added to Bishop's database the zoning and plan designation for every subdivision containing detached single family dwellings planned from 1985 through 1989 in 17 jurisdictions inside the UGB. In consultation with planners from each jurisdiction, 1000 Friends determined the maximum allowable net subdivision lot density given the comprehensive plan designation. We use their data in our calculating actual vs. allowable densities.

Evaluation Bishop's database is the most complete source of subdivision data we found in the metropolitan area. 1000 Friends compared the information in the Bishop database to planning department records and found a close correspondence. 1000 Friends meticulously added zoning and plan designations for each subdivision in their study area. 1000 Friends worked closely with planners in each jurisdiction to determine the maximum density allowed by each jurisdiction's comprehensive plan. We consider this database very reliable.

METHOD We confronted several problems in adapting the subdivision database for our analysis. First, the database does not locate subdivisions by Metro's underlying zones. Because our analysis areas are defined on UZ geography, the data presentation by analysis area becomes complicated. Second, the 1000 Friends area consists of 17 jurisdictions all located inside the UGB. We, therefore, do not have zoning information for subdivisions built outside the UGB or for subdivisions for some small jurisdictions inside the UGB. Finally, 1000 Friends study looks at subdivisions approved from 1985-89, whereas the special subdivision database contains all subdivisions developed from 1985-89. Thus, the estimates of subdivision activity do not coincide for the same time period, because two different types of activities are being measured: approvals and construction.

To deal with the first problem, we mapped the geography used in the subdivision database as closely as possible into our analysis areas. The database geography consists of several hundred subareas composing the three-county area. Fortunately, that geography generally recognizes the UGB. Where a database subarea boundary crosses an analysis area boudary, we estimated the proportion in either subarea and allocated the subarea to the analysis area containing the greater proportion of the subarea.

To deal with the second problem, we analyze two sets of data. The first set contains the number and size of all subdivision lots developed in the entire study area from 1985 through 1989. The second set, a subset of the first, contains planning information for 17 jurisdictions inside the UGB. Thus we can show the amount and density of subdivision development for the entire study area. We can, in addition, compare actual to planned densities in 17 jurisdictions all inside the UGB.

Tables 3-7a and 3-7b summarize subdivision development in the entire study area. We include the category "Rural City" to account for development in incorporated areas outside the

Portland UGB. Table 3-8 shows the number of lots in nine net-lot density categories by analysis area. Lot density is measured in lots per net acre. To determine net acres, we subtracted from the gross subdivision area the number of acres dedicated to streets and to open space. Thus five lots per net acre corresponds to a lot size of .2 acres. Table 3-9 shows the same subdivision density distribution by jurisdiction.

Table 3-7c summarizes the data showing how actual subdivision densities compare to the densities allowed by each jurisdiction's comprehensive plan. Tables 3-10 through 3-12 distribute subdivision lots by percentage of allowed density. As noted above, 1000 Friends staff added this planning data to subdivisions planned 1985 through 1989. We combined the 1000 Friends data with the developed subdivision database to allow us to use the same geography in Tables 3-10 and 3-11 as in Tables 3-7 through 3-9. The total number of lots in Tables 3-10 and 3-11 is less than that in Tables 3-8 and 3-9 for two reasons: (1) some subdivisions built in the period 1985-89 were planned prior to that period, (2) Tables 3-10 through 3-12 do not include subdivisions sited outside the UGB or in some smaller jurisdictions inside the UGB. To make study periods consistent, Table 3-12 shows the remaining subdivisions planned but not yet developed as of the end of 1989.

We calculated actual density as a percent of allowed density figure by dividing net density, as defined above, by the density allowed in each jurisdiction's comprehensive plan. 1000 Friends staff worked with planners in each jurisdiction to determine the density allowed under the plan designation in terms of net lot density. In general, they did this by using minimum lot size standards. The resulting figures provide the maximum net lot density allowed by the comprehensive plan. Note, however, that in particular circumstances other legal constraints may prevent attainment of the theoretical maximum. We did not independently verify the numbers supplied by 1000 Friends. We did, however, discuss methodologies with 1000 Friends staff throughout the study and believe their procedures lead to accurate estimates.

ANALYSIS

Tables 3-7a and 3-7b show that only about 1% of all subdivision lots were built outside UGBs. The majority were built in unincorporated Clackamas County, the rest in unincorporated Washington County. Inside the UGB and within incorporated cities outside the UGB, lots averaged 0.2 acres in size about 8700 square feet. Outside the UGB, lots averaged about 4 acres in size.

Table 3-8a distributes subdivision lots by size for each analysis area and county by showing the number of lots in each of nine density categories. Table 3-8b shows the same information in percentage terms. In the urban area of Clackamas County, 56% of all lots fall in the 4-6 lots per acre range (about 11,000 to 7,300 square feet), 31% fall in the 2-4 (about 22,000 to 11,000 square feet) lots per acre range, and 2% of the lots are greater than .5 acres in size. Surprisingly, lot density is higher in the urbanizable area. About 93% of the lots developed outside the UGB in unincorporated Clackamas County were greater than 2 acres in size. Densities inside the UGB in Multnomah County compare closely to those in Clackamas County; slightly higher densities appear inside the UGB in Washington County. About 86% of all UGB lots were built at densities higher than 4 lots per net acre. In the Washington County urban fringe, lot density varied from .5 to 2 lots per acre.

Table 3-9 breaks out the information in Table 3-8 by jurisdiciton inside and outside the UGB. In Clackamas County, UGB subdivisions in incorporated areas were developed at lower densities than subdivisions in unincorporated areas. Most of these larger lots were developed in Lake Oswego and West Linn. In Multnomah County, the subdivision densities in unincorporated areas inside the UGB are about the same as subdivision densities inside cities.

In Washington County, UGB city subdivisions are built at somewhat higher densities than UGB unincorporated subdivisions.

Tables 3-10 and 3-11 show how actual subdivision densities compare to allowed densities. The large lots built in the urban area of Clackamas County appear to have been built in areas allowing higher densities. About 2% of subdivision lots were built at less than 50% of allowed density. In Multnomah County cities about 14% of subdivisions lots were built at less than 50% of allowed density. In Washington County cities 14% of the lots were built at less than 50%of allowed density.

Table 3-12 shows data similar to that in Table 3-11 for subdivisions planned but not developed by the end of 1989. In Clackamas County, over half the subdivision lots are planned to be built at less than 50% of allowed density.

TABLE 3-7a

SUBDIVISIONS DEVELOPED, 1985-89
Number and Size of Lots by Analysis Area

Jurisdiction	Urban Area	Urbanizable Area	Urban Fringe	Rural[1] City	Rest of Urban Region	Totals
Number of Lots						
Clackamas County	2521	1273	86	182	24	4086
Multnomah County	1766	329	0	0	0	2095
Washington County	5420	2770	65	11	0	8266
Total	9707	4372	151	193	24	14447
Average Lot Size (Acres)						
Clackamas County	0.2	0.2	6.6	0.2	3.4	0.4
Multnomah County	0.2	0.2	N/A[2]	N/A	N/A	0.2
Washington County	0.2	0.2	1.0	0.2	N/A	0.2
Average	0.2	0.2	4.2	0.2	3.4	0.2

Source: Special Subdivision Database, Brent Bishop

[1] The "Rural City" category includes incorporated areas outside the Portland area UGB (e.g., Canby, Sandy, North Plains).

[2] Not Applicable because no subdivision development occurred in that area.

TABLE 3-7b

SUBDIVISIONS DEVELOPED, 1985-89
Number and Density of Lots by Jurisdiction

Jurisdiction	Net Acres	Actual Lots	Percent Total	Actual[1] Density
Clackamas County	1502	4086	28	2.7
Gladstone	7	38	1	5.5
Happy Valley	20	64	2	3.2
Lake Oswego	238	1108	27	4.7
Milwaukie	17	94	2	5.4
Oregon City	2	10	0	6.3
Tualatin	78	410	10	5.3
West Linn	193	667	16	3.4
Wilsonville	83	488	12	5.9
Subtotal: Cities Inside UGB	638	2879	70	4.5
Unincorp Inside UGB	182	915	22	5.0
Canby	32	172	4	5.5
Sandy	7	10	0	1.3
Subtotal: Cities Outside UGB	39	182	4	4.7
Unincorp Outside UGB	644	110	3	0.2
Multnomah County	466	2095	15	4.5
Fairview	3	13	1	4.9
Gresham	181	850	41	4.7
Lake Oswego Multnomah	13	51	2	3.8
Portland	218	926	44	4.2
Wood Village	4	40	2	9.2
Subtotal: Cities Inside UGB	420	1880	90	4.5
Unincorp Inside UGB	46	215	10	4.7
Washington County	1654	8266	57	5.0
Beaverton	439	2273	27	5.2
Cornelius	7	21	0	3.0
Durham	2	12	0	7.6
Forest Grove	15	58	1	3.9
Hillsboro	109	542	7	5.0
Sherwood	21	21	0	1.0

Jurisdiction	Net Acres	Actual Lots	Percent Total	Actual[1] Density
Tigard	214	1406	17	6.6
Tualatin	74	363	4	4.9
Subtotal: Cities Inside UGB	881	4696	57	5.3
Unincorp Inside UGB	703	3494	42	5.0
Gaston	2	11	0	4.7
Subtotal: Cities Outside UGB	2	11	0	4.7
Unincorp Outside UGB	68	65	1	1.0
Study Area Totals	3247	14447	100	4.4
Inside UGB	2869	14079	97	4.9
Cities	1938	9455	65	4.9
Unincorporated	931	4624	32	5.0
Outside UGB	753	368	3	0.5
Cities	41	193	1	4.7
Unincorporated	712	175	1	0.2

Source: Special Subdivision Database, Brent Bishop

[1] Lots per acre net of streets and dedicated open space.

TABLE 3-7c

SUBDIVISION DEVELOPMENT: ACTUAL VS. PLANNED DENSITY

Jurisdiction	Net[1] Acres	Actual Lots	Allowed[2] Lots	Actual Density	Allowed Density	Percent of Allowed Density
Clackamas County	631	2926	3964	4.6	6.3	74
Lake Oswego	218	1013	1491	4.6	6.8	68
Milwaukie	17	94	117	5.4	6.7	80
West Linn	169	610	859	3.6	5.1	71
Wilsonville	74	421	573	5.7	7.8	73
Subtotal: Cities	479	2138	3040	4.5	6.3	70
Unincorp Clackamas Co	152	788	924	5.2	6.1	85
Multnomah County	405	1853	2731	4.6	6.7	68
Gresham	181	850	903	4.7	5.0	94
Lake Oswego Multnomah	13	51	282	3.8	21.2	18
Portland	190	853	1425	4.5	7.5	60
Subtotal: Cities	385	1754	2610	4.6	6.8	67
Unincorp Multnomah Co	20	99	121	4.9	6.0	82
Washington County	1608	8339	13494	5.2	8.4	62
Beaverton	424	2211	3299	5.2	7.8	67
Forest Grove	15	58	92	3.9	6.2	63
Hillsboro	94	465	628	5.0	6.7	74
Sherwood	21	21	182	1.0	8.6	12
Tigard	214	1406	2052	6.6	9.6	69
Tualatin	150	761	936	5.1	6.2	81
Subtotal: Cities	918	4922	7189	5.4	7.8	68
Unincorp Washington Co	691	3417	6305	4.9	9.1	54
Study Area Totals	2644	13118	20189	5.0	7.6	65
Cities	1781	8814	12839	4.9	7.2	69
Unincorporated	863	4304	7350	5.0	8.5	59

Source: Special Subdivision Database, 1000 Friends

[1] Gross site acres minus acres dedicated to streets and open space.
[2] Calculated using minimum lot sizes corresponding to plan designations.

TABLE 3-8a

SIZE DISTRIBUTION OF NEW SUBDIVISION LOTS, 1985-89
Number of Lots by Density Class and Analysis Area

JURISDICTION/ANALYSIS AREA	Lots per Net Acre[1]									TOTALS
	0-.2	.2-.5	.5-1	1-2	2-4	4-6	6-8	8-10	>10	
Clackamas County	87	21	4	57	822	2126	805	146	18	4086
Urban Area	0	6	0	45	786	1408	252	6	18	2521
Urbanizable Area	0	0	0	12	28	605	498	130	0	1273
Urban Fringe	71	15	0	0	0	0	0	0	0	86
Rural City[2]	0	0	4	0	8	105	55	10	0	182
Rest of Urban Region	16	0	0	0	0	8	0	0	0	24
Multnomah County	0	9	3	44	444	1059	320	115	61	2095
Urban Area	0	7	0	27	427	911	248	115	31	1766
Urbanizable Area	0	2	3	17	17	148	72	40	30	329
Urban Fringe	0	0	0	0	0	0	0	0	0	0
Rural City	0	0	0	0	0	0	0	0	0	0
Rest of Urban Region	0	0	0	0	0	0	0	0	0	0
Washington County	0	0	73	89	1039	3597	2866	589	13	8266
Urban Area	0	0	0	32	532	2356	2139	361	0	5420
Urbanizable Area	0	0	19	46	507	1230	727	228	13	2770
Urban Fringe	0	0	54	11	0	0	0	0	0	65
Rural City	0	0	0	0	0	11	0	0	0	11
Rest of Urban Region	0	0	0	0	0	0	0	0	0	0
Study Area Total	87	30	80	190	2305	6782	3991	850	92	14447

JURISDICTION/ANALYSIS AREA	Lots per Net Acre[1]									TOTALS
	0-.2	.2-.5	.5-1	1-2	2-4	4-6	6-8	8-10	>10	
Urban Area	0	13	0	104	1745	4675	2639	482	49	9707
Urbanizable Area	0	2	22	75	552	1983	1297	398	43	4372
Urban Fringe	71	15	54	11	0	0	0	0	0	151
Rural City	0	0	4	0	8	116	55	10	0	193
Rest of Urban Region	16	0	0	0	0	8	0	0	0	24

Source: Special Subdivision Database, Brent Bishop

[1] The number of lots per acre net of streets and dedicated open space. The reciprocal of the lots per net acre figure is average lot size.
[2] The "Rural City" category includes incorporated areas outside the Portland area UGB (e.g., Canby, Sandy, and North Plains).

TABLE 3-8b

SIZE DISTRIBUTION OF NEW SUBDIVISION LOTS, 1985-89
Percent of Lots by Density Class and Analysis Area

JURISDICTION/ANALYSIS AREA	Lots per Net Acre[1]									TOTALS (%)
	0-.2	.2-.5	.5-1	1-2	2-4	4-6	6-8	8-10	>10	
Clackamas County	2	1	0	1	20	52	20	4	0	100
Urban Area	0	0	0	2	31	56	10	0	1	100
Urbanizable Area	0	0	0	1	2	48	39	10	0	100
Urban Fringe	83	17	0	0	0	0	0	0	0	100
Rest of Urban Region	67	0	0	0	0	33	0	0	0	100
Rural City[2]	0	0	2	0	4	58	30	6	0	100
Multnomah County	0	0	0	2	22	52	16	6	3	100
Urban Area	0	0	0	2	24	52	14	7	2	100
Urbanizable Area	0	1	1	6	6	51	25	0	10	100
Urban Fringe	0	0	0	0	0	0	0	0	0	-
Rural City	0	0	0	0	0	0	0	0	0	-
Rest of Urban Region	0	0	0	0	0	0	0	0	0	-
Washington County	0	0	1	1	13	44	35	7	0	100
Urban Area	0	0	0	1	10	44	40	7	0	100
Urbanizable Area	0	0	1	2	18	44	26	8	1	100
Urban Fringe	0	0	83	17	0	0	0	0	0	100
Rural City	0	0	0	0	0	100	0	0	0	100
Rest of Urban Region	0	0	0	0	0	0	0	0	0	-
Study Area Total (%)	1	0	1	1	16	47	28	6	1	100

JURISDICTION/ANALYSIS AREA	Lots per Net Acre[1]									TOTALS (%)
	0-.2	.2-.5	.5-1	1-2	2-4	4-6	6-8	8-10	>10	
Urban Area	0	0	0	1	18	48	27	5	1	100
Urbanizable Area	0	0	0	2	13	46	30	8	1	100
Urban Fringe	47	10	36	7	0	0	0	0	0	100
Rural City	0	0	2	0	4	60	29	5	0	100
Rest of Urban Region	67	0	0	0	0	33	0	0	0	100

Source: Special Subdivision Database, Brent Bishop

[1] The number of lots per acre net of streets and dedicated open space. The reciprocal of the lots per net acre figure is lot size.
[2] The "Rural City" category includes incorporated areas outside the Portland area UGB (e.g., Canby, Sandy, and North Plains).

TABLE 3-9a

SIZE DISTRIBUTION OF NEW SUBDIVISION LOTS, 1985-89
Number of Lots by Density Class and Jurisdiction

JURISDICTION	Lots per Net Acre									TOTALS
	0-.2	.2-.5	.5-1	1-2	2-4	4-6	6-8	8-10	>10	
Clackamas County	87	21	4	57	822	2126	805	146	18	4086
Subtotal: Cities in UGB	0	0	0	57	714	1522	521	47	18	2879
Gladstone	0	0	0	0	0	38	0	0	0	38
Happy Valley	0	0	0	12	0	52	0	0	0	64
Lake Oswego	0	0	0	0	280	562	213	47	6	1108
Milwaukie	0	0	0	0	0	94	0	0	0	94
Oregon City	0	0	0	0	0	0	10	0	0	10
Tualatin	0	0	0	0	0	410	0	0	0	410
West Linn	0	0	0	45	414	171	25	0	12	667
Wilsonville	0	0	0	0	20	195	273	0	0	488
Subtotal: Unincorp in UGB	0	6	0	0	100	491	229	89	0	915
Subtotal: Cities out UGB	0	0	4	0	8	105	55	10	0	182
Canby	0	0	0	0	8	99	55	10	0	172
Sandy	0	0	4	0	0	6	0	0	0	10
Subtotal: Unincorp out UGB	87	15	0	0	0	8	0	0	0	110
Multnomah County	0	9	3	44	444	1059	320	115	61	2095
Subtotal: Cities in UGB	0	7	0	39	427	973	248	115	31	1880
Fairview	0	0	0	0	0	13	0	0	0	13
Gresham	0	0	0	12	86	752	0	0	0	850
Lake Oswego Multnomah	0	0	0	0	34	17	0	0	0	51
Portland	0	7	0	27	307	191	248	115	31	926
Wood Village	0	0	0	0	0	0	0	40	0	40

JURISDICTION	Lots per Net Acre									TOTALS
	0-.2	.2-.5	.5-1	1-2	2-4	4-6	6-8	8-10	>10	
Subtotal: Unincorp in UGB	0	2	3	5	17	86	72	0	30	215
Washington County	0	0	58	40	806	1623	3402	2010	327	8266
Subtotal: Cities in UGB	0	0	0	15	64	297	2271	1735	314	4696
Beaverton	0	0	0	37	171	1289	746	30	0	2273
Cornelius	0	0	0	0	21	0	0	0	0	21
Durham	0	0	0	0	0	0	12	0	0	12
Forest Grove	0	0	0	0	46	0	12	0	0	58
Hillsboro	0	0	0	27	52	214	227	22	0	542
Sherwood	0	0	15	0	0	6	0	0	0	21
Tigard	0	0	0	0	7	399	738	262	0	1406
Tualatin	0	0	0	0	0	363	0	0	0	363
Subtotal: Unincorp in UGB	0	0	4	14	742	1315	1131	275	13	3494
Subtotal: Cities out UGB	0	0	0	0	0	11	0	0	0	11
Gaston	0	0	0	0	0	11	0	0	0	11
Subtotal: Unincorp out UGB	0	0	54	11	0	0	0	0	0	65
Study Area Total	87	30	65	141	2072	4808	4527	2271	406	14447
Inside Primary UGB	0	15	7	130	2064	4684	4472	2261	406	14079
City	0	7	0	111	1205	2792	3040	1897	363	9455
Unincorporated	0	8	7	19	859	1892	1432	364	43	4624
Outside Primary UGB	87	15	58	11	8	124	55	10	0	368
City	0	0	4	0	8	116	55	10	0	193
Unincorporated	87	15	54	11	0	8	0	0	0	175

Source: Special Subdivision Database, Brent Bishop

[1] The number of lots per acre net of streets and dedicated open space. The reciprocal of the lots per net acre figure is lot size.

TABLE 3-9b

SIZE DISTRIBUTION OF NEW SUBDIVISION LOTS, 1985-89
Percent of Lots by Density Class and Jurisdiction

JURISDICTION	Lots per Net Acre									TOTALS(%)
	0-.2	.2-.5	.5-1	1-2	2-4	4-6	6-8	8-10	>10	
Clackamas County	2	1	0	1	20	52	20	4	0	100
Subtotal: Cities in UGB	0	0	0	2	25	53	18	2	1	100
Gladstone	0	0	0	0	0	100	0	0	0	100
Happy Valley	0	0	0	19	0	81	0	0	0	100
Lake Oswego	0	0	0	0	25	51	19	4	1	100
Milwaukie	0	0	0	0	0	100	0	0	0	100
Oregon City	0	0	0	0	0	0	100	0	0	100
Tualatin	0	0	0	0	0	100	0	0	0	100
West Linn	0	0	0	7	62	26	4	0	2	100
Wilsonville	0	0	0	0	4	40	56	0	0	100
Subtotal: Unincorp in UGB	0	1	0	0	11	54	25	10	0	100
Subtotal: Cities out UGB	0	0	2	0	4	58	30	5	0	100
Canby	0	0	0	0	5	58	32	6	0	100
Sandy	0	0	40	0	0	60	0	0	0	100
Subtotal: Unincorp out UGB	79	14	0	0	0	7	0	0	0	100
Multnomah County	0	0	0	2	22	52	16	6	3	100
Subtotal: Cities in UGB	0	0	0	2	23	53	13	6	2	100
Fairview	0	0	0	0	0	100	0	0	0	100
Gresham	0	0	0	1	10	88	0	0	0	100
Lake Oswego Multnomah	0	0	0	0	67	33	0	0	0	100
Portland	0	1	0	3	33	21	27	12	3	100
Wood Village	0	0	0	0	0	0	0	100	0	100
Subtotal: Unincorp in UGB	0	1	1	2	8	40	33	0	14	100

JURISDICTION	Lots per Net Acre									TOTALS(%)
	0-.2	.2-.5	.5-1	1-2	2-4	4-6	6-8	8-10	>10	
Washington County	0	0	1	0	10	20	41	24	4	100
Subtotal: Cities in UGB	0	0	0	0	1	6	48	37	7	100
Beaverton	0	0	0	2	8	57	33	1	0	100
Cornelius	0	0	0	0	100	0	0	0	0	100
Durham	0	0	0	0	0	0	100	0	0	100
Forest Grove	0	0	0	0	79	0	21	0	0	100
Hillsboro	0	0	0	5	10	39	42	4	0	100
Sherwood	0	0	71	0	0	29	0	0	0	100
Tigard	0	0	0	0	0	28	52	19	0	100
Tualatin	0	0	0	0	0	100	0	0	0	100
Subtotal: Unincorp in UGB	0	0	0	0	21	38	32	8	0	100
Subtotal: Cities out UGB	0	0	0	0	0	100	0	0	0	100
Gaston	0	0	0	0	0	100	0	0	0	100
Subtotal: Unincorp out UGB	0	0	83	17	0	0	0	0	0	100
Study Area Total	1	0	0	1	14	33	31	16	3	100
Inside UGB	0	0	0	1	15	33	32	16	3	100
City	0	0	0	1	13	30	32	20	4	100
Unincorporated	0	0	0	0	19	41	31	8	1	100
Outside UGB	24	4	16	3	2	34	15	3	0	100
City	0	0	2	0	4	60	29	5	0	100
Unincorporated	50	9	31	6	0	5	0	0	0	100

Source: Special Subdivision Database, Brent Bishop

[1] The number of lots per acre net of streets and dedicated open space. The reciprocal of the lots per net acre figure is lot size.

TABLE 3-10a

RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWED DENSITY
Number of Subdivision Lots as Percent of Allowed Density
1985-89

COUNTY/ANALYSIS AREA	Percent of Allowed Density							TOTALS
	1-25	25-50	50-70	70-80	80-90	90-100	>100	
Clackamas County	0	62	508	287	551	650	868	2926
Urban Area	0	62	185	139	416	540	565	1907
Urbanizable Area	0	0	323	148	135	110	303	1019
Multnomah County	63	184	309	210	264	303	520	1853
Urban Area	63	164	294	205	233	294	440	1693
Urbanizable Area	0	20	15	5	31	9	80	160
Washington County	233	1167	2121	1392	1515	1356	555	8339
Urban Area	168	572	1241	992	1300	1075	407	5755
Urbanizable Area	65	595	880	400	215	281	148	2584
Study Area Total	296	1413	2938	1889	2330	2309	1943	13118

Source: Special Subdivision Database, 1000 Friends 1990 Housing Study

TABLE 3-10b

RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWED DENSITY
Percent of Subdivision Lots as Percent of Allowed Density
1985-89

COUNTY/ANALYSIS AREA	Percent of Allowed Density							TOTALS
	1-25	25-50	50-70	70-80	80-90	90-100	>100	
Clackamas County	0	2	19	10	19	22	29	100
Urban Area	0	3	12	7	21	28	29	100
Urbanizable Area	0	0	32	15	13	11	30	100
Multnomah County	3	10	17	11	14	16	28	100
Urban Area	4	10	17	12	14	17	26	100
Urbanizable Area	0	13	9	3	19	6	50	100
Washington County	3	14	25	17	18	16	7	100
Urban Area	3	10	21	17	23	19	7	100
Urbanizable Area	3	23	34	16	8	11	6	100
Study Area Total	2	11	22	14	18	18	15	100

Source: Special Subdivision Database, 1000 Friends 1990 Housing Study

TABLE 3-11a

RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWABLE DENSITY
Number of Subdivision Lots as Percent of Allowable Density
1985-89

Jurisdiction	Percent of Allowed Density							
	1-25	25-50	50-70	70-80	80-90	90-100	>100	Totals
Clackamas County	0	62	508	287	551	650	868	2926
Subtotal: Cities	0	56	445	277	416	305	639	2138
Lake Oswego	0	11	291	148	167	144	252	1013
Milwaukie	0	0	0	35	59	0	0	94
West Linn	0	45	134	43	190	102	96	610
Wilsonville	0	0	20	51	0	59	291	421
Unincorp Clackamas Co	0	6	63	10	135	345	229	788
Multnomah County	63	184	309	210	264	303	520	1853
Subtotal: Cities	63	176	294	205	238	294	484	1754
Gresham	0	12	5	74	142	229	388	850
Lake Oswego Multnomah	34	0	17	0	0	0	0	51
Portland	29	164	272	131	96	65	96	853
Unincorp Multnomah Co	0	8	15	5	26	9	36	99
Washington County	233	1167	2121	1392	1515	1356	555	8339
Subtotal: Cities	52	376	1196	924	1034	933	407	4922
Beaverton	37	109	915	349	328	355	118	2211
Forest Grove	0	0	46	0	0	12	0	58
Hillsboro	0	72	22	40	97	118	116	465
Sherwood	15	0	0	0	0	6	0	21

Jurisdiction	Percent of Allowed Density							
	1-25	25-50	50-70	70-80	80-90	90-100	>100	Totals
Tigard	0	195	196	253	268	321	173	1406
Tualatin	0	0	17	282	341	121	0	761
Unincorp Washington Co	181	791	925	468	481	423	148	3417
Study Area Totals	296	1413	2938	1889	2330	2309	1943	13118
Cities	115	608	1935	1406	1688	1532	1530	8814
Unincorporated	181	805	1003	483	642	777	413	4304

Source: Special Subdivision Database, 1000 Friends 1990 Housing Study

TABLE 3-11b

RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWABLE DENSITY
Percent of Subdivision Lots as Percent of Allowable Density
1985-89

Jurisdiction	Percent of Allowed Density							Totals
	1-25	25-50	50-70	70-80	80-90	90-100	>100	
Clackamas County	0	2	17	10	19	22	30	100
Subtotal: Cities	0	3	21	13	19	14	30	100
Lake Oswego	0	1	29	15	16	14	25	100
Milwaukie	0	0	0	37	63	0	0	100
West Linn	0	7	22	7	31	17	16	100
Wilsonville	0	0	5	12	0	14	69	100
Unincorp Clackamas Co	0	1	8	1	17	44	29	100
Multnomah County	3	10	17	11	14	16	28	100
Subtotal: Cities	4	10	17	12	14	17	28	100
Gresham	0	1	1	9	17	27	46	100
Lake Oswego Multnomah	67	0	33	0	0	0	0	100
Portland	3	19	32	15	11	8	11	100
Unincorp Multnomah Co	0	8	15	5	26	9	36	100
Washington County	3	14	25	17	18	16	7	100
Subtotal: Cities	1	8	24	19	21	19	8	100
Beaverton	2	5	41	16	15	16	5	100
Forest Grove	0	0	79	0	0	21	0	100
Hillsboro	0	15	5	9	21	25	25	100
Sherwood	71	0	0	0	0	29	0	100

Jurisdiction	Percent of Allowed Density							Totals
	1-25	25-50	50-70	70-80	80-90	90-100	>100	
Tigard	0	14	14	18	19	23	12	100
Tualatin	0	0	2	37	45	16	0	100
Unincorp Washington Co	5	23	27	14	14	12	4	100
Study Area Totals	2	11	22	14	18	18	15	100
Cities	1	7	22	16	19	17	17	100
Unincorporated	4	19	23	11	15	18	10	100

Source: Special Subdivision Database, 1000 Friends 1990 Housing Study

TABLE 3-12

PLANNED RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWABLE DENSITY
Number of subdivision lots approved but not constructed by end of 1989

JURISDICTION	Actual as percent of allowed density							Totals
	1-25	25-50	50-70	70-80	80-90	90-100	>100	
Clackamas County	77	80	73	14	9	13	22	288
Lake Oswego	14	80	73	14	9	0	0	190
Oregon City	0	0	0	0	0	13	0	13
Clackamas Unincorporated	63	0	0	0	0	0	22	85
Multnomah County	0	0	0	0	0	10	0	10
Multnomah Unincorporated	0	0	0	0	0	10	0	10
Washington County	0	12	109	198	71	79	72	541
Beaverton	0	0	0	66	71	14	0	151
Sherwood	0	0	0	48	0	0	0	48
Tigard	0	12	51	84	0	65	72	284
Washington Unincorporated	0	0	58	0	0	0	0	58
Study Area Total	77	92	182	212	80	102	94	839

Source: Special Subdivision Database, 1000 Friends 1990 Housing Study

3.3 SOURCE *Special Apartment Database, Great Northwest Management Company, 1985-89.*
1000 Friends of Oregon housing study (in progress), 1985-89

Description Great Northwest Management Company maintains a database containing information on all multiple family projects of 15 units and over developed from 1985 through 1989. The data include location, year developed, gross site acres, and number of units. We acquired access to summary data from this database through Brent Bishop. As part of their metropolitan housing study, 1000 Friends of Oregon updated this database surveying planners in the 17 largest jurisdictions inside the UGB to get zoning and plan designation for all multiple family projects, including those of less than 15 units, approved in the period 1985-89. The updated database includes, we believe, all multiple family projects in the 17 jurisdictions including single family attached housing (e.g., rowhouses and townhouses). We estimate those 17 jurisdictions account for at least 95% of the multiple family development in the UGB. Given the plan designation, 1000 Friends staff, in consultation with planners in each jurisdiction, determined the maximum density allowed for that designation. We use their data in our calculation of actual vs. allowable densities.

Evaluation We are aware of no more extensive multiple family database covering the Portland Metropolitan area. 1000 Friends staff believe the updated database includes all multiple-family developments planned between 1985-89. 1000 Friends staff worked closely with planners in each jurisdiction to determine maximum densities allowed in the plan. We consider this database very reliable. Note, however, that the maximum allowable density calculation is the theoretical maximum given the plan designation. Other legal factors may have prevented development to maximum build-out (e.g., height restrictions).

METHOD In Tables 3-13 through 3-15, we report units per acre and compare these densities with the maximum allowed by the jurisdiction's comprehensive plan. In this case, we did not have data showing the area dedicated to streets and open space for each development. Great Northwest obtained site acreages from assessor's records. We assumed that for multiple family developments, the assessor's acreage generally is net acreage. We divided the number of units by the assessor's site acreage to determine units per acre.

Comprehensive plans generally define maximum multiple family build-out in units per acre. The plans are often ambiguous about whether these densities are for net or gross acres. We assumed all plans use site acreage. To calculate actual density as a percent of allowed we divided our actual units per acre figure by the maximum density allowed by each jurisdiction's comprehensive plan.

ANALYSIS Table 3-13 shows that 21,584 multiple family dwelling units were planned for sites in the 17 jurisdictions inside the UGB. About 30% of these were sited in unincorporated areas. The average density inside the UGB is about 17 units per acre in incorporated areas and about 16 units per acre in unincorporated areas. In Clackamas County, the average density in unincorporated areas is twice the density in cities. The converse is true for projects in Multnomah and Washington Counties. The density allowed by the plan in unincorporated Clackamas County is more than double that allowed in cities. Several projects in unincorporated Clackamas County allowed densities of 60 units per acre. The converse is true in Multnomah County. In each case higher actual densities follow higher allowed densities.

Tables 3-14a and 3-14b show how dwelling unit density is distributed. Over the entire study area, about 80% of multiple family projects were planned at between 10 and 30 units per acre.

In Clackamas County cities, nearly 40% of the projects were planned a t less than 15 units per acre. In unincorporated Washington County, about 60% of the projects were planned for less than 15 units per net acre. Density generally was higher in Multnomah County.

Tables 3-15a and 3-15b compare actual to allowed densities. The tables show that about 20% of the dwelling units were planned to exceed maximum allowable density. Projects may have exceeded the maximum density requirements for one of at least two reasons: (1) institutional residence facilities may be exempt from density requirements; (2) density may be transferred from single family to multiple family portions of planned unit developments. About 30% of all dwelling units were planned at under 70% of allowed density. These dwelling units are about evenly split between incorporated and unincorporated areas. Most of the development in unincorporated Clackamas County is below 70% of allowed density, but the allowed density is high. About 40% of the development in Multnomah County cities is below 70% of allowed density. Washington County densities generally are higher relative to the allowed density.

TABLE 3-13

MULTIPLE FAMILY DWELLING UNITS PLANNED, 1985-89
Number of Units and Average Density

Jurisdiction	Acres	Actual Units	Actual Density	Allowed Units	Allowed Density
Clackamas County	380.9	5940	15.6	8199	21.5
Lake Oswego	220.7	2951	13.4	4344	19.7
Milwaukie	9.9	190	19.2	252	25.5
Oregon City	21.7	359	16.5	401	18.5
West Linn	4.5	98	21.6	94	20.8
Wilsonville	66.5	851	12.8	670	10.1
Subtotal: Cities	323.3	4449	13.8	5761	17.8
Unincorp Clackamas Co	57.6	1491	25.9	2438	42.3
Multnomah County	83.6	2323	27.8	3436	41.1
Gresham	67.0	1443	21.5	1935	28.9
Portland	12.7	814	64.0	1431	112.5
Subtotal: Cities	79.7	2257	28.3	3366	42.2
Unincorp Multnomah Co	3.9	66	17.1	70	18.1
Washington County	843.2	13321	15.8	16228	19.2
Beaverton	270.9	4772	17.6	5970	22.0
Forest Grove	3.6	281	77.8	73	20.2
Hillsboro	10.8	237	21.9	197	18.2
Sherwood	2.1	24	11.7	23	11.2
Tigard	124.1	2059	16.6	2606	21.0
Tualatin	86.9	1166	13.4	1139	13.1
Subtotal: Cities	498.3	8539	17.1	10008	20.1
Unincorp Washington Co	344.9	4782	13.9	6220	18.0
Study Area Totals	1307.8	21584	16.5	27863	21.3
Cities	901.3	15245	16.9	19135	21.2
Unincorporated	406.5	6339	15.6	8728	21.5

Source: Special Apartment Database, 1000 Friends 1990 Housing Study

TABLE 3-14a

DENSITY DISTRIBUTION OF PLANNED MULTIPLE FAMILY DWELLING UNITS, 1985-89
Number of Dwelling Units by Density Class

Jurisdiction	Units per Acre									Totals
	1-5	5-10	10-15	15-20	20-25	25-30	30-50	50-100	>100	
Clackamas County	79	466	1140	2599	477	179	1000	0	0	5940
Lake Oswego	79	426	256	1889	161	20	120	0	0	2951
Milwaukie	0	0	40	0	150	0	0	0	0	190
Oregon City	0	0	33	258	68	0	0	0	0	359
West Linn	0	0	0	0	98	0	0	0	0	98
Wilsonville	0	40	811	0	0	0	0	0	0	851
Unincorp Clackamas Co	0	0	0	452	0	159	880	0	0	1491
Multnomah County	0	0	215	286	664	189	327	190	452	2323
Gresham	0	0	172	263	603	172	233	0	0	1443
Portland	0	0	7	23	31	17	94	190	452	814
Unincorp Multnomah Co	0	0	36	0	30	0	0	0	0	66
Washington County	0	782	4678	3840	3101	337	302	281	0	13321
Beaverton	0	0	1044	2334	1183	56	155	0	0	4772
Forest Grove	0	0	0	0	0	0	0	281	0	281
Hillsboro	0	0	0	64	25	148	0	0	0	237
Sherwood	0	0	24	0	0	0	0	0	0	24
Tigard	0	131	466	524	866	0	72	0	0	2059
Tualatin	0	317	586	110	78	0	75	0	0	1166
Unincorp Washington Co	0	334	2558	808	949	133	0	0	0	4782
Study Area Totals	79	1248	6033	6725	4242	705	1629	471	452	21584

Source: 1000 Friends of Oregon 1990 Housing Study.

TABLE 3-14b

DENSITY DISTRIBUTION OF PLANNED MULTIPLE FAMILY DWELLING UNITS, 1985-89
Percent of Total Dwelling Units by Density Class

Jurisdiction	Units per Acre									Totals (%)
	1-5	5-10	10-15	15-20	20-25	25-30	30-50	50-100	>100	
Clackamas County	1	8	19	44	8	3	17	0	0	100
Lake Oswego	3	14	9	64	5	1	4	0	0	100
Milwaukie	0	0	21	0	79	0	0	0	0	100
Oregon City	0	0	9	72	19	0	0	0	0	100
West Linn	0	0	0	0	100	0	0	0	0	100
Wilsonville	0	5	95	0	0	0	0	0	0	100
Unincorp Clackamas Co	0	0	0	30	0	11	59	0	0	100
Multnomah County	0	0	9	12	29	8	14	8	19	100
Gresham	0	0	12	18	42	12	16	0	0	100
Portland	0	0	1	3	4	2	12	23	56	100
Unincorp Multnomah Co	0	0	55	0	45	0	0	0	0	100
Washington County	0	6	35	29	23	3	2	2	0	100
Beaverton	0	0	22	49	25	1	3	0	0	100
Forest Grove	0	0	0	0	0	0	0	100	0	100
Hillsboro	0	0	0	27	11	62	0	0	0	100
Sherwood	0	0	100	0	0	0	0	0	0	100
Tigard	0	6	23	25	42	0	3	0	0	100
Tualatin	0	27	50	9	7	0	6	0	0	100
Unincorp Washington Co	0	7	53	17	20	3	0	0	0	100
Study Area Totals	0	6	28	31	20	3	8	2	2	100

Source: 1000 Friends of Oregon 1990 Housing Study.

TABLE 3-15a

MULTIPLE FAMILY RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWED DENSITY, 1985-89
Number of Dwelling Units

Jurisdiction	Actual as Percent of Allowed Density[1]							Totals
	0-25	25-50	50-70	70-80	80-90	90-100	>100	
Clackamas County	6	716	2356	566	517	282	1497	5940
Lake Oswego	6	517	1173	364	129	114	648	2951
Milwaukie	0	0	150	0	0	0	40	190
Oregon City	0	0	33	0	258	0	68	359
West Linn	0	0	0	0	0	0	98	98
Wilsonville	0	40	0	0	0	168	643	851
Unincorp Clackamas Co	0	159	1000	202	130	0	0	1491
Multnomah County	0	432	435	282	235	152	787	2323
Gresham	0	236	172	263	142	63	567	1443
Portland	0	196	263	19	93	23	220	814
Unincorp Multnomah Co	0	0	0	0	0	66	0	66
Washington County	180	452	2095	1620	2392	4142	2440	13321
Beaverton	0	279	1416	630	651	673	1123	4772
Forest Grove	0	0	0	0	0	0	281	281
Hillsboro	0	0	0	25	0	0	212	237
Sherwood	0	0	0	0	0	0	24	24
Tigard	0	40	306	499	952	178	84	2059
Tualatin	0	0	0	122	0	843	201	1166
Unincorp Washington Co	180	133	373	344	789	2448	515	4782
Study Area Total	186	1600	4886	2468	3144	4576	4724	21584

Source: 1000 Friends of Oregon 1990 Housing Study.

[1] The allowed density is the maximum allowed by the plan designation. Other legal requirements may prevent this theoretical maximum from being reached.

TABLE 3-15b

MULTIPLE FAMILY RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWED DENSITY, 1985-89
Percent of Total Dwelling Units

Jurisdiction	Actual as Percent of Allowed Density							TOTALS(%)
	0-25	25-50	50-70	70-80	80-90	90-100	>100	
Clackamas County	0	12	40	10	9	5	25	100
Lake Oswego	0	18	40	12	4	4	22	100
Milwaukie	0	0	79	0	0	0	21	100
Oregon City	0	0	9	0	72	0	19	100
West Linn	0	0	0	0	0	0	100	100
Wilsonville	0	5	0	0	0	20	76	100
Unincorp Clackamas Co	0	11	67	14	9	0	0	100
Multnomah County	0	19	19	12	10	7	34	100
Gresham	0	16	12	18	10	4	39	100
Portland	0	24	32	2	11	3	27	100
Unincorp Multnomah Co	0	0	0	0	0	100	0	100
Washington County	1	3	16	12	18	31	18	100
Beaverton	0	6	30	13	14	14	24	100
Forest Grove	0	0	0	0	0	0	100	100
Hillsboro	0	0	0	11	0	0	89	100
Sherwood	0	0	0	0	0	0	100	100
Tigard	0	2	15	24	46	9	4	100
Tualatin	0	0	0	10	0	72	17	100
Unincorp Washington Co	4	3	8	7	16	51	11	100
Study Area Total	1	7	23	11	15	21	22	100

Source: 1000 Friends of Oregon 1990 Housing Study

[1] The allowed density is the maximum allowed under the plan designation. Other legal requirements may prevent this theoretical maximum from being reached.

3.4 WASHINGTON COUNTY SUBAREA STUDY

3.4 SOURCE *Special Subdivision Database, Brent Bishop, 1985-89 (see appendix section 3.2).*
Special Apartment Database, 1000 Friends of Oregon, 1985-89 (see appendix section 3.3).
Washington County Residential Land Partitions Files, 1986-89.
City of Beaverton Residential Land Partitions Files, 1986-89.

METHOD Because of the size of the Portland Metropolitan area, we were limited in the detail of our analysis to the detail of our area-wide databases. Fortunately, the special subdivision and apartment databases are quite detailed. To increase the detail one step further, we focused on a subarea of Washington County. This subarea includes (1) the area in the City of Beaverton south of Tualatin Valley Highway, (2) the unincorporated Metzger area east of Beaverton, (3) the unincorporated area west of Beaverton inside the UGB, and (4) the Cooper Mountain area outside the UGB. This part of Washington County is one of the fastest growing parts of the Portland metropolitan area. This subarea study is not meant to be representative of the entire metropolitan area.

We used the three sources of data listed above. In developing the subdivision analysis in Tables 3-16 through 3-18, we followed the same procedure described in appendix section 3.2. In developing the multiple family analysis in Tables 3-19 through 3-21, we followed the same procedure described in appendix section 3.3. We gathered the partitions data from Washington County and City of Beaverton partitions files for the period 1986 through 1989. The 1985 files in Washington County had been archived and were difficult to retrieve. For each plan designation, we used the same allowable density figures as in the subdivision and multiple family analyses. We located developments using township, range, and section identifiers.

TABLE 3-16

SUBDIVISION DEVELOPMENT, 1985-89

Area	Lots	Density	Allowed Density	% of Allowed
Beaverton Area	1746	5.1	7.8	65
Metzger Area	190	5.0	6.4	78
W. Beaverton Area	391	4.9	8.7	57
Cooper Mtn. Outside the UGB	60	1.0	N/A[1]	N/A
Totals	2387	4.6	N/A	N/A

Source: Special Subdivision Database, Brent Bishop

[1] As noted in appendix section 3.2, we do not have zoning data for subdivisions outside the UGB.

TABLE 3-17

NEW SUBDIVISION LOT SIZE DISTRIBUTION, 1985-89
Number of Lots by Density Class

Area	Lots per net Acre									
	0-.2	.2-.5	.5-1	1-2	2-4	4-6	6-8	8-10	>10	TOTALS
Beaverton	0	0	0	11	128	1078	499	30	0	1746
Percent	0.0	0.0	0.0	0.6	7.3	61.7	28.6	1.8	0.0	100.0
Metzger Area	0	0	0	0	16	141	28	5	0	190
Percent	0.0	0.0	0.0	0.0	8.4	74.2	14.7	2.6	0.0	100.0
W. Beaverton Area	0	0	4	0	103	68	189	14	13	391
Percent	0.0	0.0	1.0	0.0	26.3	17.4	48.3	3.6	3.3	100.0
Cooper Mtn Outside UGB	0	0	49	11	0	0	0	0	0	60
Percent	0.0	0.0	81.7	18.3	0.0	0.0	0.0	0.0	0.0	100.0
Totals	0	0	53	22	247	1287	716	49	13	2387
Percent	0.0	0.0	2.2	0.9	10.4	53.9	30.0	2.1	0.5	100.0

Source: Special Subdivision Database, Brent Bishop

TABLE 3-18

SINGLE FAMILY RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWED DENSITY
Number of Subdivision Lots Built as Percent of Allowed Density, 1985-89

Area	Percent of Allowed Density							
	1-25	25-50	50-70	70-80	80-90	90-100	>100	TOTALS
Beaverton	37	75	806	329	133	248	118	1746
Percent	2.1	4.3	46.2	18.8	7.6	14.2	6.8	100.0
Metzger Area	0	11	5	112	6	37	19	190
Percent	0.0	5.8	2.6	58.9	3.2	19.5	10.0	100.0
W. Beaverton Area	4	128	53	87	61	45	13	391
Percent	1.0	32.7	13.6	22.3	15.6	11.5	3.3	100.0
Totals	41	214	864	528	200	330	150	2327
Percent	1.7	9.2	37.1	22.7	8.6	14.2	6.5	100.0

Source: Special Subdivision Database, Brent Bishop

TABLE 3-19

MULTIPLE FAMILY RESIDENTIAL DEVELOPMENT

Area	Units	Density[1]	Allowed Density	% of Allowed
Beaverton	4168	20.35	20.7	98
Metzger Area	124	18.37	17.9	102
W. Beaverton Area	51	10.70	10.4	102
Totals	4343	20.08	20.4	101

Source: Special Apartment Database, 1000 Friends of Oregon

[1] To determine net density, we assumed that 15% of the gross site area was dedicated for streets and open space.

TABLE 3-20

DENSITY DISTRIBUTION OF NEW MULTIPLE FAMILY DWELLING UNITS, 1985-89
Number of Dwelling Units

Area	Units per Net[1] Acre									
	1-5	5-10	10-15	15-20	20-25	25-30	30-50	50-100	>100	Totals
Beaverton	0	0	0	1920	984	1109	155	0	0	4168
Percent	0.0	0.0	0.0	46.1	23.6	26.6	3.7	0.0	0.0	100.0
Metzger Area	0	0	22	48	0	54	0	0	0	124
Percent	0.0	0.0	17.7	38.7	0.0	43.5	0.0	0.0	0.0	100.0
W. Beaverton Area	0	0	51	0	0	0	0	0	0	51
Percent	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Totals	0	0	73	1968	984	1163	155	0	0	4343
Percent	0.0	0.0	1.7	45.3	22.7	26.8	3.6	0.0	0.0	100.0

Source: Special Apartment Database, 1000 Friends of Oregon

[1] To determine net density, we assumed that 15% of the gross site area was dedicated for streets and open space.

TABLE 3-21

MULTIPLE FAMILY RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWED DENSITY, 1985-89
Number of Dwelling Units

Area	Actual as a Percent of Allowed Density[1]							Totals
	0-25	25-50	50-70	70-80	80-90	90-100	>100	
Beaverton	0	0	790	344	912	456	1666	4168
Percent	0.0	0.0	19.0	8.3	21.9	10.9	40.0	100.0
Metzger Area	0	0	0	0	0	0	124	124
Percent	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
W. Beaverton Area	0	0	0	0	0	0	51	51
Percent	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Totals	0	0	790	344	912	456	1841	4343
Percent	0.0	0.0	18.2	7.9	21.0	10.5	42.4	100.0

Source: Special Apartment Database, 1000 Friends of Oregon

[1] To determine net density, we assumed that 15% of the gross site area was dedicated for streets and open space.

TABLE 3-22

PARTITIONS, 1986-89

Area	Lots	Density	Allowed Density	% of Allowed
Beaverton	63	0.8[1]	7.6	10
Metzger Area	54	3	6.5	46
W. Beaverton Area	32	0.8	9.2	9
Cooper Mtn Outside UGB	26	0.2	N/A[2]	N/A
Totals	175	0.6	N/A	N/A

Source: Washington County Partition Files, Beaverton Partition Files

[1] Removing the 10 largest partitions increases the net density figure to 3.7.

[2] We did not calculate the percent of actual to allowed density for areas outside the UGB because (1) the allowed density is more difficult to determine, and (2) the measure is less relevant outside the UGB.

TABLE 3-23

NEW PARTITION SIZE DISTRIBUTION, 1986-89
Number of New Partitions by Density Class

Area	Partitions per Net Acre									
	0-.2	.2-.5	.5-1	1-2	2-4	4-6	6-8	8-10	>10	Totals
Beaverton	5	5	4	2	11	19	10	7	0	63
Percent	7.9	7.9	6.3	3.2	17.5	30.2	15.9	11.1	0.0	100.0
Metzger Area	0	0	1	7	15	25	3	3	0	54
Percent	0.0	0.0	1.9	13.0	27.8	46.3	5.6	5.6	0.0	100.0
W. Beaverton Area	1	0	2	2	3	16	5	3	0	32
Percent	3.1	0.0	6.3	6.3	9.4	50.0	15.6	9.4	0.0	100.0
Cooper Mtn Outside UGB	8	1	16	1	0	0	0	0	0	26
Percent	30.8	3.8	61.5	3.8	0.0	0.0	0.0	0.0	0.0	100.0
Totals	14	6	23	12	29	60	18	13	0	175
Percent	8.0	3.4	13.1	6.9	16.6	34.3	10.3	7.4	0.0	100.0

Source: Washington County and Beaverton Partition Files

TABLE 3-24

PARTITIONS: ACTUAL VS. ALLOWED DENSITY, 1986-89
Number of Partitions

Area	Partitions per Net Acre							
	1-25	25-50	50-70	70-80	80-90	90-100	>100	Totals
Beaverton	18	12	2	16	3	4	8	63
Percent	28.6	19.0	3.2	25.4	4.8	6.3	12.7	100
Metzger Area	6	14	13	3	7	8	3	54
Percent	11.1	25.9	24.1	5.6	13.0	14.8	5.6	100
W. Beaverton Area	7	7	8	1	3	3	3	32
Percent	21.9	21.9	25.0	3.1	9.4	9.4	9.4	100
Cooper Mtn Outside UGB	N/A[1]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Totals	31	33	23	20	13	15	14	149
Percent	20.8	22.1	15.4	13.4	8.7	10.1	9.4	100

Source: Washington County and City of Beaverton Partitions Files

[1] We did not calculate the percent of actual to allowed density for areas outside the UGB because (1) the allowed density is more difficult to determine, and (2) the issue is less relevant outside the UGB.

4.0 URBAN LIVABILITY ISSUES

4.1 SOURCE *Home Selling Price Listings*, Oregon Multiple Listings Service, Portland.; *Apartment Data Center Rent Survey, 1985-1989*, Apartment Data Center; additional calculations by ECO Northwest.

Description Oregon Multiple Listings Service (OMLS) is an organization that compiles information about the housing market for specific areas across the state. OMLS collects its housing sales information from realtors who sell houses. Once a participating realtor sells a home, they provide information including (1) sales price, (2) number of days on the market, and (3) type of house sold to the OMLS. OMLS uses this information to issue monthly reports that include the following data: (1) number of homes sold by type during the previous month; (2) average sales price by type for the previous month; and (3) current average selling time for homes, by type. Table 4-1 shows the average selling price for homes in the Portland metropolitan area between 1985 and 1990.

The Apartment Data Center conducts a survey of about 120 property management companies and apartment complex owners twice each year (October and March). This survey typically covers about 40,000 units. According to Jerry Mason (Director of the Apartment Data Center), there are somewhere between 80,000 and 100,000 apartment units in the Portland area. This means that this survey typically covers between 40 to 50 percent of all apartments in the Portland area. The number of units included in this survey has grown at a fairly steady rate over the past 10 years. Table 4-2 shows the average monthly rental rates for average sized multiple family dwelling units in various sections of the Portland metropolitan area for the years 1985 and 1989.

Evaluation The OMLS data provide, at best, an approximate picture of changes in housing prices. There is the possibility that if certain price ranges in the market are not selling that the data will show a change in housing price where none exists. The large number of sales reported protect against this to some degree. Although the OMLS home sales price data does not include all homes sold in a particular area over time, it is the most complete standard source available that allows comparison between different parts of the state.

Since the Apartment Data Center Survey is made on an anonymous basis, the Apartment Data Center is not able to document whether the same companies and owners complete the survey each year, but Jerry Mason (Director, Apartment Data Center) thinks that a high percentage of those who respond to the survey do so on a repeating basis. The Apartment Data Center Survey is the most comprehensive time-series data source available to us for apartment rents. Another useful data, maintained by Great Northwest Property Management (Brent Bishop) lacked comparable historical data necessary for making estimates of changes.

ANALYSIS Table 4-1 shows that the average home selling price in the Portland metropolitan area increased from $70,015 to $92,763 between 1985 and 1990, an increase of about 33%. The metropolitan areas which experienced the largest increases in home prices were (1) Oregon City/Mollala, (2) Tigard-Wilsonville, and (3) West Portland.

Table 4-2 shows that the average monthly rent per multi-family dwelling unit in the Portland area increased from $315 to $417 between 1985 and 1989, an increase of about 32%. Rental rates increased the most during this period in (1) Milwaukie/Oregon City, and (2) Tigard/Lake Oswego.

Both the average home selling price and the average monthly rental rates for multiple family dwelling units in the Portland metropolitan area grew at a slightly faster rate between 1985 and 1988 than did per capita income in the metropolitan area. While both home prices and monthly rents increased by about 30 percent over this period, per capita income in the metropolitan area increased by about 25 percent over the same period. Though income data for 1989 are not available, our guess is that housing prices will be shown to have increased faster than incomes during that period.

TABLE 4-1

AVERAGE HOME PRICES FOR PORTLAND-AREA HOMES
1985 AND 1990

Area	1985	1990	% Change
West Portland	$98,794	$141,008	42.73
Lake Oswego-West Linn	120,114	161,307	34.29
Tigard-Wilsonville	78,903	113,224	43.50
Beaverton-Aloha	71,773	97,646	36.05
Clark County	61,352	75,935	23.77
Hillsboro-Forest Grove	67,447	84,596	25.43
Oregon City-Molalla	53,435	85,134	59.32
Milwaukie-Gladstone	63,516	85,253	34.22
Gresham-Troutdale	64,201	81,519	26.97
Southeast Portland	49,860	60,063	20.46
Northeast Portland	51,300	59,445	15.88
North Portland	36,614	38,744	5.82
Total Metro Area	70,015	92,763	32.49

Source: *Oregon Multiple Listing Service Report, 1985 and 1990*, Oregon Multiple Listings Service.

TABLE 4-2

AVERAGE MONTHLY RENT FOR PORTLAND-AREA MULTI-FAMILY DWELLING UNITS, 1985-89

Portland Area	Average Monthly Rental Rates For Average Size Units		
	1985	1989	Percent Change
Close-In: SW/NW	$330	$439	33.0
Tigard/Lake Oswego	326	449	37.7
Beaverton	337	445	32.1
Close-In: SE/NE	285	351	23.2
Milwaukie/Oregon City	293	409	39.6
North Portland	268	310	15.7
Eastside Gresham	294	360	22.5
Total Metro Area	315	417	32.4

Source: *Apartment Data Center Rent Survey, 1985-1989*, Apartment Data Center; additional calculations by ECO Northwest.

4.2 SOURCE *Oregon Department of Transportation, Highway Division*. Level of service and traffic volumes for 1985 and 1989.

Description Table 4-3 shows average weekday traffic and level of service estimated for ten key highway links and intersections in the Portland Metropolitan area for 1985 and 1989. Traffic volume counts are regularly gathered by both ODOT for highways and streets in Portland Metropolitan area. Our analysis presents average weekday volumes (AWD) for selected highways, arterials, and intersections in the Portland Metropolitan area. Level of service is a commonly used measure of traffic congestion and is presented on a scale from A to F (A being free-flowing traffic and F being gridlock). Level of service is a function of traffic volume (usually P.M. peak hour volume) and highway design capacity.

Evaluation Traffic volume data is compiled by the Oregon Department of Transportation. Level of service is a function of traffic volume and highway design capacity and is generally considered the best indicator of traffic congestion on highways, arterials and streets. ODOT provides the best available source of traffic volume and LOS data.

ANALYSIS ODOT data indicate that traffic volumes in the Portland area are increasing. Both AWD and peak-hour traffic volumes increased at all but one of the highway links shown in Table 4-3. The level of service decreased at all but one link shown in Table 4-3 between 1985 and 1989. Traffic congestion is increasing in the Portland area.

TABLE 4-3

TRAFFIC VOLUME AND LEVEL OF SERVICE
PORTLAND METROPOLITAN AREA
1985-89

Location	Direction	Number of Vehicles (000's)				Lanes	Level of Service	
		1985		1989				
		AWD	Peak Hr.	AWD	Peak Hr.		1985	1989
Sunset Highway	EB	61.0	5.9 AM	68.5	6.6 AM	3	D	E
Zoo-Jefferson	WB	60.0	5.8 PM	66.5	5.8 PM	3	E	E-F
Highway 217	SB	33.6	2.8 AM	47.7	4.1 AM	2	D-E	E-F
Greenberg-Scholls								
I-205 Freeway	NB	23.9	2.7 PM	30.4	3.2 PM	2	C	D
Stafford-10th Ave.	SB	23.8	2.2 AM	31.2	3.2 AM	2	E	E-F
I-84 Freeway @	EB	41.2	6.0 PM	75.4	6.4 PM	3	E	E-F
21st Avenue								
I-5 South	NB	53.0	6.3 AM	63.7	7.1 AM	3	D-E	E-F
Terwilliger-Corbett								
McLoughlin Blvd.	NB	23.6	2.6 AM	23.0	2.9 AM	2	E	E-F
S. of 17th Ave.								
Clackamas Highway	WB	16.2	1.3 AM	23.0	1.8 AM	2	E	E-F
E. of 82nd Drive								
T.V. Highway	EB	18.6	1.8 AM	20.4	1.9 AM	2	D-E	E
W. of Murray Blvd.								
Highway 99 West	SB	16.0	1.5 PM	17.1	1.7 PM	2	E	E-F
W. of Greenberg								
Highway 99 East	SB	16.0	1.2 PM	16.4	1.6 PM	2	D	D
N. of Vineyard Rd.								

Source: Oregon Department of Transportation, Highway Division, Region II.

4.3 SOURCE *Oregon Air Quality, 1985-88 Annual Reports*, Oregon Department of Environmental Quality, Air Quality Control Division.

Description Data that describe (1) the number of days various communities experienced pollution levels above the National Ambient Air Quality Standards, (2) annual area and point emission levels for the Portland metropolitan area and other case study counties across Oregon.

Table 4-4 shows the number of good, moderate, and unhealthful air quality days for 1985 and 1988 for Portland and Medford.

Table 4-5 shows the number of days Portland, Medford, and Bend exceeded pollution levels above the National Ambient Air Quality Standards between 1984 and 1988.

Evaluation The State Department of Environment Quality collects and maintains the most accurate air quality indicator data available. However, differences in area and point source emissions between 1985 and 1988 may be due, in part, to differences in measuring techniques.

ANALYSIS Table 4-4 shows that the number of days classified as "good" in terms of air quality increased from 186 in 1985 to 227 in 1988. The number of days classified as "unhealthful" increased from 5 in 1985 to 6 in 1988. Table 4-5 shows no clear change in the metropolitan area's performance on specific air pollutants. In general, the air quality in Portland has not deteriorated over the past five years, and has probably improved. DEQ staff (Russell, 1990) indicate that air quality has improved during the period between 1985-89, mostly in the downtown Portland area. One reason cited for this improvement was the 1985 backyard burning ban.

TABLE 4-4

AIR POLLUTION INDEX VALUES
1985 and 1988

	Medford		Portland	
Number of Days	1985	1988	1985	1988
Good	58	150	186	227
Moderate	259	199	162	122
Unhealthful	35	16	5	6

Source: Oregon Air Quality Annual Report 1984 and 1988, Oregon Department of Environmental Quality.

TABLE 4-5

NUMBER OF DAYS EXCEEDING STANDARDS FOR CASE STUDY CITIES
1984-88

City	1984	1985	1986	1987	1988
Fine Particulate (PM10)					
Portland	0	0	1	0	0
Bend	0	1	0	1	0
Medford	5	13	2	5	7
Carbon Monoxide (CO)					
Portland	2	1	1	1	1
Medford	18	35	16	4	2
Ozone					
Portland	2	2	3	1	2
Medford	0	0	0	0	0

Source: Oregon Air Quality 1988 Annual Report, Oregon Department of Environmental Quality.

4.4 SOURCE *Assessed Value and Park Acreage Estimates for the Tualatin Hills Parks and Recreation District*, James McElhinney, Tualatin Hills Parks and Recreation District (THPRD).

Description We evaluated park land only for the Beaverton subarea, which is served by THPRD. The district covers approximately 50 square miles and includes the City of Beaverton. Table 4-6 shows acreages of developed and undeveloped park lands in the Tualatin Hill Parks and Recreation District for 1985 and 1989 and the total assessed value of parkland in the District for 1985 and 1989.

Evaluation The Tualatin Hills Parks and Recreation District is the best data source for park acreage and value in the Beaverton area.

ANALYSIS Table 4-6 shows that THPRD acquired 50 acres on 25 park sites between 1985 and 1989. The majority of growth in the District has been in undeveloped land (11.1 percent between 1985 and 1989). Total park acreage increase by 5.6 percent between 1985 and 1989. Total assessed value of parkland in the District increased by 21 percent from $46 to $55 million[1]. The data show that the Beaverton area has not ignored the need to expand park facilities as it grows.

TABLE 4-6

PARKS ACREAGE AND VALUE
Tualatin Hills Parks and Recreation District
1985 and 1989

	1985	1989	Percent Change
Number of Park Sites	100	125	25.0
Total Acreage	900	950	5.6
Developed Parks	558	570	2.2
Undeveloped Parks	342	380	11.1
Total Assessed Value (million $)	45.6	55.2	21.1

Source: Assessed Value and Park Acreage Estimates for the Tualatin Hills Parks and Recreation District, 1985 and 1989.

[1] This figure has not been adjusted for inflation.

5.0 DEVELOPMENT POTENTIAL

5.1 SUMMARY Table 5-1 summarizes the estimated development potential outside of Urban Growth Boundaries in Clackamas, Multnomah, and Washington Counties. The county analysis from which this summary is drawn follow. These analyses provide a complete description of the data sources and methods used in estimating the development potential.

There are nearly 6,800 vacant lots within rural exception areas. Potential subdivisions and partitions allow for the creation of an additional 1,927 vacant lots. Thus, there is the possibility for the development of over 8,700 lots within rural exception areas in the Portland Metro Area. Over 50 percent of these lots are in Clackamas County. Although, there is the potential for the development of approximately 8,700 lots, it is not likely that all of these lots will be developed because of physical constraints, access, facilities problems or market preference.

To estimate future nonresource dwelling approvals, we used the average rate of approvals for each county between 1983 through 1988. This average was multiplied by 12 to estimate the number of approvals for the period of 1989 through 2000. The estimates do not consider market conditions. If nonresource dwellings continue to be approved at the same rate, then approximately 1,030 nonresource dwellings would be approved through the year 2000. Almost 70 percent (706) of the nonresource dwellings will be located in Clackamas County.

Total nonresource development potential (dwelling units) is estimated by combining the number of vacant lots in exception areas that could result from land division under current zoning, potential new lots in exception areas, and nonresource dwellings. We estimate that there is the potential for about 9,800 additional nonresource dwelling units outside of Urban Growth Boundaries in the Portland Metro Area. Most of the potential dwelling units (5,360) are in Clackamas County.

TABLE 5-1

SUMMARY OF DEVELOPMENT CAPACITY OUTSIDE THE UGB
1989-2000

County	Exception Areas		Resource Area	Development Potential Outside UGB (Number of Dwelling Units)[1]
	Vacant Lots	Potential New Lots	Potential Residential Development	
Clackamas	3,750	2650	760	7,160
Multnomah[2]	1,029	226	108	1,363
Washington[2]	2,098	751	216	3,065
Total	6,877	3,627	1,084	11,588

Source: ECO Northwest.

[1] These estimates do not account for unbuildable land.
[2] Estimates for development potential in exception areas are for years 1987-2000

5.2 SOURCE *Dave Poese, Planner, Clackamas County Planning and Economic Development Division*, 1990.

Description Tables 5-2 and 5-3 show the acreage zoned for residential use in rural Clackamas County for the years 1980 and 1990. The number of residential dwelling units, vacant lots, potential lots, and potential residential sites is also shown.

Evaluation The data presented in Tables 5-2 and 5-3 are the best available. The numbers are conservative because of the exclusion of data relating to rural residential development along the Mt. Hood Corridor. Also, the number of potential sites is only a rough estimate and is probably conservative because of the methodology used in determining this number. It was assumed that only 75 percent of the potential ownerships would be developed because of less than maximum use of the potential land and physical characteristics that would limit residential development. However, the data does provide a range for potential development. The actual number of potential lots is somewhere between the number of vacant ownerships and the potential number of vacant ownerships.

METHOD All of the figures shown in Tables 5-2 and 5-3 were provided by the Clackamas County Planning and Economic Development Division. The 1980 figures were derived from findings of various planning and zoning actions by Clackamas County from 1978 to 1981. The data for 1990 are based on estimates. The Division estimated that approximately 100 residential units were added per year over the decade. It was also estimated that approximately 10 other uses were added per year. The distribution among the various zoning districts were estimated by consulting with various county personnel. Estimates for potential residential sites were derived by multiplying the number of potential lots by .75, under the assumption that only about 75 percent of the potential lots would be developed because of physical constraints and less than maximum use of the lots.

ANALYSIS There is a total of 76,000 acres (excluding the Mt. Hood Corridor) designated for non-resource use in rural Clackamas County. Clackamas County estimated that approximately 1,000 additional dwellings have been developed over the past decade, and that there is the potential for another 4,600 dwellings, although physical constraints may limit the development all potential lots. The majority of development is occurring in 5-acre minimum zones. These zones account for over 75 percent of the residential acreage and development. Only about 5 percent of the development is occurring on 1-acre minimum lots.

TABLE 5-2

EXCEPTION AREA RESIDUAL DEVELOPMENT
CLACKAMAS COUNTY[1]
1980

Zoning	Acres	Dwelling Units	Vacant Lots	Additional Lots if Divided	Potential Residential Sites	Adjusted Residential Sites[2]
Ind./Com.	1,000	50	NA	NA	NA	0
R4-1 acre	1,500	700	200	150	350	250
R4-2 acre	2,500	950	300	350	650	500
RRFF-5 acre	58,000	9,300	3,400	900	4,300	3,250
FF-10 acre	13,000	1,000	500	200	700	500
Total	76,000	12,000	4,400	1,600	6,000	4,500

Source: Dave Poese, Planner, Clackamas County Planning and Economic Development Division.

[1] Excludes rural land in the Mt. Hood Corridor.
[2] Adjusted residential sites equals 75% of potential residential sites to account of unbuildable land.

TABLE 5-2a

EXCEPTION AREA RESIDUAL DEVELOPMENT
CLACKAMAS COUNTY
(Mt. Hood Corridor)
1980

Zoning	Acres	Dwelling Units	Vacant Lots	Additional Lots if Divided	Potential Residential Sites	Adjusted Residential Sites[1]
FF-10	250	25	5	5	10	10
RRFF-5	2000	575	295	95	390	290
RR	2750	1000	1200	1200	2400	1800
Total	5000	1600	1500	1300	2800	2100
HR	1250	400	100	1500	1600	1200
MRR	250	200	50	1550	1600	1200
Total	1500	600	150	3050	3200	2400

Source: Dave Poese, Planner, Clackamas County Planning and Economic Development Division.

[1] Adjusted residential sites equals 75% of potential residential sites to account of unbuildable land.

TABLE 5-3

EXCEPTION AREA RESIDUAL DEVELOPMENT
CLACKAMAS COUNTY[1]
1990

Zoning	Acres	Dwelling Units	Vacant Lots	Additional Lots if Divided	Potential Residential Sites	Adjusted Residential Sites[2]
Ind./Com.	1,000	50	NA	NA	NA	0
R4-1 acre	1,500	750	150	100	250	200
R4-2 acre	2,500	1,000	250	300	550	400
RRFF-5 acre	58,000	10,100	2,800	400	3,200	2,400
FF-10 acre	13,000	1,100	450	150	600	450
Total	76,000	13,000	3,650	950	4,600	3,450

Source: Dave Poese, Planner, Clackamas County Planning and Economic Development Division.

[1] Excludes rural land along the Mt. Hood Corridor.
[2] Adjusted residential sites equals 75% of potential residential sites to account of unbuildable land.

TABLE 5-3a

EXCEPTION AREA RESIDUAL DEVELOPMENT
CLACKAMAS COUNTY
(Mt. Hood Corridor)
1990

Zoning	Acres	Dwelling Units	Vacant Lots	Additional Lots if Divided	Potential Residential Sites	Adjusted Residential Sites[1]
FF-10	250	30	5	0	5	5
RRFF-5	2000	670	245	50	295	195
RR	2750	1300	1000	900	1900	1350
Total	5000	2000	1250	950	2200	1650
HR	1250	600	75	1325	1400	1050
MRR	250	400	25	1375	1400	1050
Total	1500	1000	100	2700	2800	2100

Source: Dave Poese, Planner, Clackamas County Planning and Economic Development Division.

[1] Adjusted residential sites equals 75% of potential residential sites to account of unbuildable land.

5.3 SOURCE *Narrative for Clackamas County Mapping Project: Land Use Approvals in Resource Zones 1983-1988*, 1000 Friends of Oregon, August 1989.

Description The number of nonforest and nonfarm dwellings that were approved in resource zones for the period of 1984 through 1988 is shown in Table 5-4. The yearly average of approvals during this period is also shown.

Evaluation The estimates for nonfarm and nonforest dwelling approvals in Clackamas County by 1000 Friends of Oregon is the most current available. The estimates were derived from reviewing all applications for a dwelling in resource zones which were approved between July 1, 1983 and December 31, 1988. The number of approvals for 1983 is excluded in Table 5-4 because data for the entire year were not available.

We estimated the number of future approvals by calculating the yearly average of approvals during the period of 1984 through 1988. This figure was then multiplied by twelve to estimate the number of approvals for the period of 1989 through 2000. The estimates for future approvals does not consider market conditions.

ANALYSIS For the period of 1984 through 1988, a yearly average of about 23 nonfarm dwellings and 35 nonforest dwelling were approved in Clackamas County. If this rate were to continues through the 1990s, then approximately 280 additional nonfarm dwellings and about 425 additional nonforest dwellings would be approved. If it is assumed that this rate of approval will continue, and that these tax lots are not used for resource production, then nearly 1,000 residential lots will be created outside of the Urban Growth Boundary and outside of exception areas.

TABLE 5-4

NONFARM AND NONFOREST DWELLING APPROVALS
CLACKAMAS COUNTY

	Nonfarm Dwellings	Nonforest Dwellings
1984	11	30
1985	18	37
1986	41	35
1987	22	29
1988	25	46
Total Approvals 1984-88	117	177
5 Year Average/1984-88	23.4	35.4
Estimated number of Approvals 1989-2000	281	425
Estimated number of Approvals 1984-2000	398	602

Source: *Narrative for Clackamas County Mapping Project: Land Use Approvals in Resource Zones 1983-1988*, 1000 Friends of Oregon, August, 1989; estimates for future approvals by ECO Northwest.

5.4 SOURCE *1986 Land Use Mapping Survey and 1990 Zoning Maps*, Multnomah County Planning and Development Division.

Description Table 5-5 shows the number of developed and vacant lots within rural exception areas in Multnomah County. The potential number of additional lots that could be created by partitions or subdivisions is also shown.

Evaluation There exists no document pertaining to residential development within exception areas in Multnomah County. The data were derived from a 1986 Land Use Mapping Survey with used A&T data and field inspection. Since this Survey was completed in 1986, the data describes conditions as of 1986 and not present development conditions. However, the data is the most current available.

METHOD Since current documents or maps pertaining to rural residential development do not exist, we used the 1986 Land Use Mapping Survey to determine residual development. We analyzed each Survey map that covered land within Multnomah County to determine rural residential development. The Survey maps showed the zoning, acreage, and development of each lot within Multnomah County. Using this information, we were able to count the number of developed lots, vacant lots, and potential lots for each zone that allows rural residential development.

ANALYSIS There are approximately 2,360 developed lots within rural exception areas in Multnomah County. Almost 50 percent of these developed lots are located in multiple-use agriculture zones. Approximately 1,029 lots located in rural exception areas were vacant in 1986. Allowing for partitions or subdivisions, there is the potential for the creation of an additional 226 lots within exception areas. We estimate the total development potential at 1,255 lots.

TABLE 5-5

EXCEPTION AREA RESIDUAL DEVELOPMENT
MULTNOMAH COUNTY
1986

Zoning	Developed Lots	Vacant Lots	Potential New Lots
Rural Center (RC)	182	118	58
Rural Residential (RR)	1,070	526	129
Multiple Use Agriculture (MU4-20)	1,108	385	39
Total	2,360	1,029	226

Source: 1986 Land Use Mapping Survey, Multnomah County Planning and Development.

5.5 SOURCE *Local Review Order*, Multnomah County Planning and Development Division, 1990.

Description The number of nonresource dwellings that were approved in resource zones for the period of 1981 through 1987 is shown in Table 5-6. The yearly average of approvals during this period is also shown.

Evaluation The figures shown in Table 5-6 are the most current available. The estimates were derived from the Local Review Order. We estimated for the number of future approvals by calculating the yearly average of approvals during the period of 1981 through 1987 and multiplying by thirteen to estimate the number of approvals for the period of 1988 through 2000, and rounding. The estimates for future approvals does not consider market conditions.

ANALYSIS For the period of 1981 through 1987, a yearly average of 8.3 nonresource dwelling permits were issued in resource zones in Multnomah County. It this rate of approval were to continue, an additional 108 nonresource dwellings would be approved by 2000. The Local Review Order states that the dwelling permits were issued for small acreages that were in separate ownerships. The document also states that new or unexpected land use patterns have not resulted from the approvals. It appears that nonresource dwellings have not significantly reduced the amount of resource land in Multnomah County.

TABLE 5-6

NON-RESOURCE DWELLING APPROVALS
MULTNOMAH COUNTY

	Nonresource Dwellings
Total Approvals 1981-87	58
7 Year Average/1981-87	8.3
Estimated number of Approvals 1988-2000	108
Estimated number of Approvals 1983-2000	166

Source: *Local Review Order,* Multnomah County Planning and Development Division, 1990; estimates for future approvals by ECO Northwest.

5.6 SOURCE *Washington County Comprehensive Plan - Exceptions Statement Document*, Washington County Department of Land Use and Transportation, 1986.

Description Table 5-7 shows the number of exception areas and the total acreage of exception areas in Washington County. The number of developed lots, vacant lots, and potential for additional lots is also shown.

Evaluation The data presented in Table 5-7 is taken directly from the Washington County Comprehensive Plan - Exceptions Statement Document, 1986. The data are the most complete available. The figures presented also include lots that are designated for commercial and industrial use. However, since the majority of lots are designated for residential use, the data give a relatively good picture of residential development within exception areas. Estimates for potential new lots are derived by determining the possible of number of lots that can be created by partitioning or subdividing lots under the present zoning. Since nearly all of the lots designated for commercial and industrial uses have already been developed, we assume the figures given for potential development represent potential residential development.

ANALYSIS There are 142 exception areas located in Washington County. In 1986, these exception areas consisted of 5,806 parcels, 2,098 of which were vacant. Allowing for partitions or subdivisions, there is the potential for an additional 751 lots. This creates the potential for an additional 2,849 lots to be developed; an equal number of lots have already been developed. Thus, under present zoning, the amount of development in exception areas has the potential to double in the future.

TABLE 5-7

EXCEPTION AREA RESIDUAL DEVELOPMENT
WASHINGTON COUNTY

Number of Exception Areas	Total Acreage	Number of Developed Lots	Number of Vacant Lots	Number of Potential Additional Lots	Total Number of Potential Developed Lots
142	26,653	2,849	2,098	751	2,849

Source: *Washington County Comprehensive Plan - Exceptions Statement Document*, Washington County Department of Land Use and Transportation, 1986.

5.7 SOURCE *Proposed Local Review Order Washington County Comprehensive Plan for Rural Area*, Washington County Department of Land Use and Transportation, 1990.

Description The number of nonforest and nonfarm dwellings that were approved in resource zones for the period of 1983 through 1988 is shown in Table 5-8. The yearly average of approvals during this period is also shown.

Evaluation The figures shown in Table 5-8 are the most current available. The estimates were derived from reviewing all applications for a dwelling in resource zones which were approved during the period 1983 through 1988.

We estimated the number of future approvals by calculating the yearly average of approvals during the period of 1983 through 1988. This figure was then multiplied by twelve to estimate the number of approvals for the period of 1989 through 2000. The estimates for future approvals does not consider market conditions.

ANALYSIS For the period of 1983 through 1988, a yearly average of 14 nonfarm dwellings and 4 nonforest dwellings were approved in Washington County. If this rate were to continue through the 1990s, then approximately 168 additional nonfarm dwellings and about 48 additional nonforest dwellings would be approved.

TABLE 5-8

NONFARM AND NONFOREST DWELLING APPROVALS
WASHINGTON COUNTY

	Nonfarm Dwellings	Nonforest Dwellings
Total Approvals 1983-88	84	24
6 Year Average/1983-88	14	4
Estimated number of Approvals 1989-2000	168	48
Estimated number of Approvals 1983-2000	252	72

Source: Proposed Local Review Order Washington County Comprehensive Plan for Rural Area, Washington County Department of Land Use and Transportation, 1990; estimates for future approvals by ECO Northwest.

6.0 NATIONAL URBAN GROWTH DATA

6.1 SOURCE *1990 Places Rated Almanac*; *1990 Information Please Almanac; Coldwell 1989 Home Price Comparison Index, Coldwell Banker, May 1990; Urban Freeway Congestion: Quantification of the Problem and Effectiveness of Potential Solutions*. ITE Journal, January 1987.

Description Data that describe various measures of urban growth for Portland and selected Western U.S. cities. Table 6-1 shows various density measures (i.e., population density, and total park acres per 1,000 residents) for Portland and seven other Western U.S. cities. Table 6-2 shows the average 1989 home selling price (for 3-4 bedroom homes) and the 1990 home price index for Portland and nine other cities. Table 6-3 shows an urban freeway congestion severity index for Portland and seven other cities for 1994 and 2005.

Evaluation The data presented in Table 6-1 are standard measures of density and urban growth. The usefulness of these measures, however, is limited by differences in geography between the cities presented. For example, the population density for Seattle is affected greatly by the fact that much of Seattle consists of lakes and waterways. Measurements of park acres include only city-owned parks within each urban areas.

The average home selling price and home price index measurements presented in Table 6-2 were derived through interviews and mailed surveys with various real estate organizations and chambers of commerce in each of the cities cited. Note that the average home selling price refers to three-and four-bedroom homes only. The home price index uses the score of 100 as a central gauge. Although these home price measurements do not include all homes within a given city, they are the best standardized indicators we could identify.

Table 6-3 presents a measure of urban freeway congestion for Portland and seven other cities. These measures were developed through interviews with state highway officials in each state, and an evaluation of traffic volume and capacity data for each freeway section. Note that these congestion measurements only refer to freeways within each city -- they do not include other roads or highways within each city. Table 6-3 shows only projected data for 1994 and 2005.

ANALYSIS Table 6-1 shows that, Portland has a lower population density than all but two of the other cities presented. While Portland has fewer city-owned park acres per 1,000 residents (9,400) than Tucson, Phoenix, and Denver, it has far more than Seattle, Sacramento, or St. Louis. Of the eight cities presented, Portland had the second shortest daily round-trip commute time in 1989 (45.8 minutes)

Table 6-2 shows that the average 1989 home price in Portland ($116,296 for three and four bedroom homes) was less than all of the cities presented except Phoenix and Denver (whose housing markets are both very poor). With respect to all types of homes sold during 1989, Portland had the lowest home price index (73) of the cities presented. The data clearly show that, on average, home prices in Portland are lower than those in most of the other cities presented.

Although the Portland-area freeways are expected to become more congested by 2005, most of the other cities are expected to experience much more urban freeway congestion than the Portland area. In terms of the urban freeway congestion index presented in Table 6-3, Portland had an index of about 1,700 in 1984 (ranking sixth) and is projected to have an index

of about 9,000 (ranking fifth) in 2005. While Portland's index looks good compared to Seattle and San Francisco, the index gets five times greater because delays are expected to increase much faster than vehicle-miles.

Table 6-1

COMPARISON OF URBAN DENSITY MEASURES
For Portland and Selected Western U.S. Cities

City	Land Area (Sq. Mi.)	1988 Population	Population/ Sq. Mile	Park Area (Acres)	Park Acres/ 1,000 Residents	Employment/Acre	Average 1989 Daily Commute (Minutes)
Portland	103	387,870	3,735	9,400	24.2	2.9	45.8
San Francisco	46.1	749,000	16,247	NA	NA	13.2	55.2
Sacramento	98	326,400	3,330	2,100	6.5	2.6	42.7
Seattle	84	486,200	3,362	5,785	9.8	5.8	50.8
St. Louis	61.4	426,300	6,942	2,639	6.2	4.6	50.6
Denver	110.6	505,000	4,566	13,448	26.7	3.4	48.6
Phoenix	324	894,070	2,759	29,925	33.5	2.6	47.7
Tucson	99	358,850	3,624	25,349	70.6	3.1	46.4

Source: *1990 Places Rated Almanac; 1990 Information Please Almanac.*

Table 6-2

AVERAGE 1989 HOME SELLING PRICE AND HOME PRICE INDEX
For Portland and Selected Western U.S. Cities

City	1989 Average Sales Price[1]	1989 Average Sales Price/Square Foot[2]	1989 Home Price Index[3]
San Francisco	$636,700	$289.41	266
Sacramento	231,337	105.15	109
Seattle	180,833	82.20	102
Tucson	128,533	58.42	83
Tacoma	128,500	58.41	93
St. Louis	126,359	57.44	89
Salt Lake City	125,500	57.05	73
PORTLAND	116,296	52.86	73
Phoenix	115,166	52.35	96
Denver	108,167	49.17	88

Source: *Coldwell 1989 Home Price Comparison Index*, Coldwell Banker, May 1990; *1990 Places Rated Almanac*.

[1]Coldwell Banker 1989 Home Price Comparison Index.
[2]Coldwell Banker 1989 Home Price Comparison Index.
[3]1990 Places Rated Almanac.

Table 6-3

URBAN FREEWAY CONGESTION SEVERITY INDEX, 1984 AND 2005
For Portland and Selected U.S. Western Cities

Urban Area	1984	2005
San Francisco	7,634	18,734
Seattle	7,406	27,523
Denver	4,454	9,828
Salt Lake City	2,132	5,811
Sacramento	1,803	8,037
PORTLAND	1,696	9,372
St. Louis	1,612	4,938
Phoenix	987	12,717

Source: Lindley, Jeffrey, "Urban Freeway Congestion: Quantification of the Problem and Effectiveness of Potential Solutions". *ITE Journal, January 1987.*

Congestion severity index = Total delay/million vehicle-miles of travel